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SUPPLEMENT A LA CONNAISSANCE DES TEMPS • PARIS 1985
BUREAU DES LONGITUDES

ÉPHÉMÉRIDES DES SATELLITES DE JUPITER, SATURNE ET URANUS POUR 1986

EPHEMERIDES OF THE SATELLITES OF JUPITER, SATURN AND URANUS FOR 1986

les éditions



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PUBLICATIONS DU
BUREAU DES LONGITUDES

- La *Connaissance des Temps* (Ephémérides Astronomiques de la Lune et des planètes pour 1986). Editée par l'EPSHOM, BP426, F-29275 Brest Cedex, France

Autres suppléments à la *Connaissance des Temps* :

- Ephémérides des satellites faibles de Jupiter (VI, VII, VIII, IX) et de Saturne (IX) pour 1986
- Phénomènes et configurations des satellites Galiléens de Jupiter pour 1986
- Configurations des huit premiers satellites de Saturne pour 1986

Autres publications du Bureau des Longitudes, éditées par Gauthier-Villars, Paris :

- Annuaire du Bureau des Longitudes, Ephémérides pour 1986
- Ephémérides nautiques pour l'an 1986
- Encyclopédie Scientifique de l'Univers :
 - La galaxie, l'univers extra-galactique (1980)
 - La physique (1981)
 - La terre, les eaux, l'atmosphère (réédition, 1984)
 - Les étoiles, le système solaire (réédition, 1985)

PUBLICATIONS OF
THE BUREAU DES LONGITUDES

- *The Connaissance des Temps* (Astronomical Ephemerides of the Moon and the Planets for 1986). Published by EPSHOM, BP426, F-29275 Brest Cedex, France

Other supplements to the *Connaissance des Temps* :

- *Ephemerides of the Faint Satellites of Jupiter (VI, VII, VIII, IX) and of Saturn (IX) for 1986*
- *Phenomena and configurations of the Galilean Satellites of Jupiter for 1986*
- *Configurations of the First Eight Satellites of Saturn for 1986*

Other publications of the Bureau des Longitudes, published by Gauthier-Villars, Paris (in French) :

AVERTISSEMENT

Depuis 1980, la *Connaissance des Temps* publie les éphémérides du Soleil, de la Lune, des planètes et des satellites Galiléens de Jupiter sous forme de coefficients de Tchébycheff. A partir de 1981, des éphémérides des huit premiers satellites de Saturne ont été publiées sous la même forme dans un supplément à la *Connaissance des Temps*. Ces éphémérides ayant été appréciées par les utilisateurs, nous avons décidé d'étendre ces publications à d'autres satellites naturels du Système Solaire.

Depuis 1985, nous publions dans un même recueil des éphémérides des satellites Galiléens de Jupiter, des huit premiers satellites de Saturne et des cinq satellites d'Uranus. Les éphémérides ne sont plus représentées à l'aide de coefficients de Tchébycheff, mais à l'aide de fonctions mixtes du paramètre « temps » comprenant des termes séculaires et des termes périodiques. Cette représentation permet de garder une bonne précision tout en diminuant notablement le nombre de valeurs numériques à publier et en autorisant une plus grande facilité d'emploi.

La liste des satellites dont nous publions les éphémérides n'est pas limitative et nous envisageons de l'étendre en fonction des données dont nous disposerons.

En dehors des éphémérides proprement dites cet ouvrage contient des données diverses sur les satellites de Jupiter, Saturne et Uranus et présente un formulaire permettant de calculer les phénomènes des satellites Galiléens de Jupiter

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FOREWORD

Since 1980, *Connaissance des Temps* has published ephemerides of the Sun, the Moon, the Planets and the Galilean Satellites of Jupiter as tables of Chebychev polynomials. From 1981, ephemerides of the First Eight Satellites of Saturn have been published under the same form in a supplement to the *Connaissance des Temps*. These ephemerides have been well received by the users ; hence, we now intend to enlarge the publication to incorporate other natural satellites of the planets.

Starting from 1985, we have gathered in this booklet, the ephemerides of the Galilean Satellites of Jupiter, the First Eight Satellites of Saturn and the Five Satellites of Uranus. The representation does not use Chebychev polynomials. It appears that a mixed form of representation, involving secular and periodic terms and depending directly on time, allows sufficient accuracy and reduces the amount of numerical data to be published. Furthermore, it is very easy to use these tables.

The list of the satellites, the ephemerides of which are published, is not limited and will be extended as soon as it is possible.

Beside the tables, the present publication contains various data concerning the satellites of Jupiter, Saturn and Uranus. We will also present, a formula which permits the calculation of the phenomena of the Galilean Satellites.

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PRÉSENTATION DES ÉPHÉMÉRIDES
PRESENTATION OF THE EPHEMERIDES

CONTENU

On trouve dans cette publication :

— des données sur les satellites Galiléens de Jupiter rassemblant les résultats d'un certain nombre de travaux théoriques ou d'observation effectués sur ces satellites, ainsi que des données (en général recommandées par l'UAI) sur l'ensemble des satellites de Jupiter, Saturne et Uranus, extraites de l'*Encyclopédie du Bureau des Longitudes* ;

— des tables permettant de calculer les positions des satellites Galiléens de Jupiter, des huit premiers satellites de Saturne et des cinq satellites d'Uranus ;

— des tables permettant de calculer les prédictions des phénomènes des satellites Galiléens de Jupiter.

Les éphémérides des satellites donnent les coordonnées différentielles tangentiellles des satellites par rapport au centre de la planète :

$$X = \Delta\alpha \cos \delta \text{ et } Y = \Delta\delta$$

où δ est la déclinaison de la planète et où $\Delta\alpha$ et $\Delta\delta$ sont les différences en ascension droite et en déclinaison entre le satellite et la planète.

Ces coordonnées sont des coordonnées moyennes rapportées à l'équateur de la date pour les satellites Galiléens de Jupiter et à l'équateur 1950.0 pour les satellites de Saturne et Uranus. L'axe des Y est dirigé vers le pôle de l'équateur moyen des coordonnées (nord) et l'axe des X est orienté dans le sens des ascensions droites croissantes (est).

Les théories utilisées pour la construction des éphémérides sont les suivantes :

— satellites Galiléens : la théorie de Sampson (1921) améliorée par Lieske (1977) ; les constantes introduites ont été déterminées par Arlot (1982) ;

— huit premiers satellites de Saturne : les théories issues des travaux de Rapaport (1977), de Kozai (1959) et de Struve (1930) ;

— satellites d'Uranus : la théorie issue du travail de Veillet (1983).

**REPRÉSENTATION
DES COORDONNÉES**

Soit T une date Julienne appartenant à l'intervalle de temps $T_0, T_0 + \Delta t$, les coordonnées des satellites pour la date T sont données par la formule :

$$\left. \begin{matrix} X \\ Y \end{matrix} \right\} = A_0 + A_1 \cdot t + B_0 \sin(Nt + F_0) + B_1 \cdot t \sin(Nt + F_1) + B_2 \cdot t^2 \sin(Nt + F_2) + C_0 \sin(2Nt + P_0) \quad (1)$$

CONTENTS

This publication contains the following :

— *data on the Galilean satellites of Jupiter which sum the results of theoretical or observational studies in addition to various data (most of which are recommended by the IAU) concerning all known satellites of Jupiter, Saturn and Uranus. These data are found in the Encyclopédie du Bureau des Longitudes ;*

— *tables which allow the computation of the positions of the Galilean satellites of Jupiter, the first eight satellites of Saturn and the five satellites of Uranus ;*

— *tables to calculate the phenomena of the Galilean satellites of Jupiter.*

These ephemerides of the satellites give the differential tangential coordinates of the satellites with respect to the centre of mass of the planet :

$$X = \Delta\alpha \cos \delta \text{ and } Y = \Delta\delta$$

where δ is the declination of the planet, $\Delta\alpha$ and $\Delta\delta$ the separations in right ascension and declination between the satellite and the planet.

These coordinates are mean coordinates (equator of the date for the Galilean satellites and equator of 1950.0 for the satellites of Saturn and Uranus). The Y -axis is set towards the pole of the equator (North) and the X -axis towards the increasing right ascensions (East).

The theories which have been used for the construction of the ephemerides are :

— *Galilean satellites : Sampson's theory (1921) improved by Lieske (1977) ; the constants introduced have been determined by Arlot (1982) ;*

— *first eight satellites of Saturn : theories from the studies of Rapaport (1977), Kozai (1959) and Struve (1930) ;*

— *satellites of Uranus : theory from Veillet's thesis (1983).*

**REPRESENTATION
OF THE COORDINATES**

Let T be a Julian date belonging to the interval of time $T_0, T_0 + \Delta t$. The coordinates of the satellites for the date T are given by the formula :

où :

- $t = T - T_0$
- $A_0, A_1, B_0, F_0, B_1, F_1, B_2, F_2, C_0, P_0$ sont les coefficients numériques valables pour l'intervalle de temps $T_0, T_0 + \Delta t$ contenant T
- N est la fréquence associée au satellite considéré. Cette fréquence est en général proche de celle du satellite lui-même, sauf dans le cas d'Hypérion pour lequel on prend une fréquence proche de celle de Titan du fait de l'existence d'un très gros terme perturbateur de fréquence plus grande que celle du satellite lui-même.

Cette représentation sous forme de fonctions mixtes (termes séculaires et sinusoïdaux) utilise le caractère quasi périodique des variations des positions des satellites naturels des planètes. On trouvera des explications détaillées sur cette représentation dans Chapront et Vu (1984).

DESCRIPTION DES ÉPHÉMÉRIDES

Pour chaque satellite et pour chaque intervalle de temps, on donne :

- les dates de début et de fin de l'intervalle de validité ainsi que la date Julienne du début de l'intervalle ; cet intervalle peut varier de 2 jours pour Mimas à 32 jours pour les gros satellites d'Uranus ;
- deux jeux de coefficients $A_0, A_1, B_0, F_0, B_1, F_1, B_2, F_2, C_0, P_0$: l'un pour la coordonnée X , l'autre pour la coordonnée Y . Notons que pour quelques satellites (Titan, par exemple), certains coefficients ne sont pas donnés car ils sont nuls ;
- la valeur de la fréquence N associée au satellite est indiquée en haut de chaque page.

Les unités sont : la seconde de degré pour les coefficients A_0, B_0, C_0 , la seconde de degré par jour pour A_1, B_1 , la seconde de degré par (jour)² pour B_2 ; les phases F_0, F_1, F_2, P_0 sont mesurées en radian. N est en radian par jour et le paramètre « temps » t est compté en jours à partir du début de l'intervalle (époque T_0).

ÉCHELLES DE TEMPS

L'argument « temps » des éphémérides publiées ici est le TDB (temps dynamique barycentrique) que l'on peut confondre, à la précision des éphémérides, avec le TDT (temps dynamique terrestre), proche du TE (temps des éphémérides) et réalisé physiquement par la mesure du TAI (temps atomique international). On a :

$$\text{TDT} = \text{TAI} + 32,184 \text{ s}$$

where :

- $t = T - T_0$
- $A_0, A_1, B_0, F_0, B_1, F_1, B_2, F_2, C_0, P_0$ are numerical coefficients valid for the time interval $T_0, T_0 + \Delta t$
- N is the frequency associated with the chosen satellite. Generally, N is close to the natural frequency of the satellite itself. Nevertheless, in the case of Hyperion, N is close to the frequency of Titan because of the appearance of a large disturbing term which frequency is larger than the proper frequency of the satellite.

This representation with mixed functions (secular and sinusoidal terms) of time, makes use of the quasi-periodic character of the variations of the differential coordinates of the satellites. Detailed explanations about this representation are given in Chapront and Vu (1984).

DESCRIPTION OF THE EPHEMERIDES

The following is given for each satellite and for each time interval :

- the dates of the beginning and end of the interval and the Julian date of the beginning. The duration of the time interval may cover from 2 days (in the case of Mimas) to 32 days (in the case of the larger satellites of Uranus) ;
- two sets of coefficients $A_0, A_1, B_0, F_0, B_1, F_1, B_2, F_2, C_0, P_0$: the first set for the X -coordinate and the second set for the Y -coordinate. Let us note that for some satellites (Titan for example) some coefficients, with zero value, are not listed ;
- the value of frequency N , associated with the satellite indicated at the top of each page.

Units of the data : A_0, B_0, C_0 in arcsecond ; A_1 and B_1 in arcsecond per day and B_2 in arcsecond per (day)². For phases F_0, F_1, F_2, P_0 the unit is the radian. N is expressed in radian per day and t in days from the beginning of the interval (epoch T_0).

TIME-SCALES

The time argument of the ephemerides is TDB (barycentric dynamical time) which can be identified with TDT (terrestrial dynamic time) close to the former definition of ET (ephemeris time) and physically made by measuring TAI (international atomic time), so that :

$$\text{TDT} = \text{TAI} + 32.184 \text{ s}$$

Les événements astronomiques étant mesurés dans l'échelle UTC (temps universel coordonné), le tableau ci-dessous donne la relation (entre le 1^{er} janvier 1979 et le 31 décembre 1984) entre TDT et UTC (d'après la relation entre TAI et UTC publiée par le BIH).

Astronomical events are measured in the time-scale UTC (coordinate universal time). The table below gives the correspondence (from 1979 January 1 to 1984 December 31) between TDT and UTC (using the relationship between TAI and UTC published by BIH).

		TDT-UTC
1979 Jan. 1 - 1980 Jan. 1	1	50.184 s
1980 Jan. 1 - 1981 Juil. 1	1	51.184 s
1981 Juil. 1 - 1982 Juil. 1	1	52.184 s
1982 Juil. 1 - 1983 Juil. 1	1	53.184 s
1983 Juil. 1 - 1984 Déc. 31		54.184 s

Pour 1986, on ne sait pas encore quelle en sera la valeur ; on peut cependant prendre 55 secondes, l'erreur commise n'ayant que peu d'influence sur la valeur des positions calculées des satellites.

For 1986, the value of TDT-UTC is not yet known ; one may take 55 seconds : the error made will have little effect on the values of the calculated positions of the satellites.

EXEMPLE DE CALCUL D'UNE POSITION

Pour calculer les coordonnées X et Y d'un satellite pour une date T exprimée en UTC :

- on effectue une correction déduite du tableau du paragraphe précédent pour se ramener à l'échelle TDT (identifiée à TDB) ;
- on cherche parmi les tableaux représentant X et Y celui qui correspond à l'intervalle $T_0, T_0 + \Delta t$ dans lequel se trouve T ;
- on applique la formule (1) avec $t = T - T_0$.

Il faut insister sur le fait que la représentation n'est valable que sur son intervalle de validité : T doit être compris entre T_0 et $T_0 + \Delta t$.

EXEMPLE : Calculer les coordonnées tangentielles de Téthys (3^e satellite de Saturne) par rapport à la planète, le 5 janvier 1986 à 23 h 30 min UTC.

On effectue d'abord une correction pour se ramener à l'échelle TDB. Pour 1986 nous avons choisi 55 secondes ; la date T est donc le 5 janvier 1986 à 23 h 30 min 55 s TDB.

Les coefficients nécessaires au calcul de X et Y sont ceux de la page 67 correspondant à l'intervalle du 1^{er} janvier à 0 h au 17 janvier à 0 h. On a, pour X :

$$A_0 = 0., \quad A_1 = 0., \quad B_0 = 37.7362, \quad B_1 = 0.06321, \quad B_2 = 0.000489, \quad C_0 = 0.0032 \\ F_0 = 2.928197, \quad F_1 = 1.9175, \quad F_2 = 3.6436, \quad P_0 = 2.6640$$

et pour Y :

$$A_0 = -0.0012, \quad A_1 = 0., \quad B_0 = 15.6140, \quad B_1 = 0.02993, \quad B_2 = 0.000148, \quad C_0 = 0.0013 \\ F_0 = 4.591307, \quad F_1 = 3.8733, \quad F_2 = 5.4243, \quad P_0 = 4.3350$$

On applique ensuite la formule (1) :

$$\left. \begin{matrix} X \\ Y \end{matrix} \right\} = A_0 + A_1 \cdot t + B_0 \sin(Nt + F_0) + B_1 \cdot t \sin(Nt + F_1) + B_2 \cdot t^2 \sin(Nt + F_2) + C_0 \sin(2Nt + P_0)$$

EXAMPLE OF A POSITION CALCULATION

To compute the X and Y coordinates of a satellite for a date T (expressed in UTC), one has to :

- apply the correction deduced from the preceding table to express the date T in TDT (identified with TDB) ;
- select from the tables of coefficients, the one which corresponds to the time interval $T_0, T_0 + \Delta t$ where T is found ;
- apply formula (1) with $t = T - T_0$.

It is important to state that the representation is valid only for its time interval : T must belong to the interval $T_0, T_0 + \Delta t$.

EXAMPLE : Let us compute the tangential coordinates of Tethys (third satellite of Saturn) with respect to the planet for 1986 January 5, 23 h 30 min UTC.

First, the date must be corrected in order to fit with the TDB time-scale. For 1986, we choose 55 seconds ; so, the date T is 1986 January 5, 23 h 30 min 55 s TDB.

The coefficients necessary to compute X and Y are given on page 67 (interval from January 1, 0 h to January 17, 0 h). We read for X :

and for Y :

On a ici :

$$N = 3,328 \text{ radian/jour}$$

t est le nombre de jours écoulés entre le 1^{er} janvier à 0 h (début de l'intervalle) et le 5 janvier à 23 h 30 min 55 s, soit 4,979 803 jours.

On obtient finalement :

$$\begin{aligned} X &= + 22,78'' \\ Y &= + 11,64'' \end{aligned}$$

Where :

$$N = 3.328 \text{ radian/day}$$

t is the number of days elapsed between January 1, 0 h (beginning of the interval) and January 5, 23 h 30 min 55 s. Hence $t = 4.979 803$ days.

Finally, we get :

$$\begin{aligned} X &= + 22.78'' \\ Y &= + 11.64'' \end{aligned}$$

PRÉCISION DES ÉPHÉMÉRIDES

Les théories dont sont issues les éphémérides sont construites pour la plupart avec une précision meilleure que 0,01" géocentrique.

Les observations utilisées pour l'ajustement des constantes et aussi certains défauts de la théorie ne permettent d'obtenir en réalité qu'une précision de 0,05" ; cette précision peut n'être que de 1" pour certains satellites de Saturne.

La représentation en fonctions mixtes publiée ici a été déterminée de façon à ce que l'écart avec la théorie-source soit toujours inférieur à 0,01".

ACCURACY OF THE EPHEMERIDES

The theories from which are built the ephemerides have an internal precision better than 0.01" (in a geocentric reference frame).

In reality, the observations used to fit the constants and shortcomings in the theories, allow a precision of only 0.05" which may reach 1" for some satellites of Saturn.

The representation in mixed functions, as published here, has been determined in such a way that the difference between the representation and the source always remains below 0.01".

PHÉNOMÈNES DES SATELLITES GALILÉENS DE JUPITER

Les prédictions des phénomènes des satellites Galiléens sont données suivant une représentation polynômiale en fonction d'une variable temporelle. La méthode (Thuillot, 1983) permet une représentation compacte puisque 14 coefficients suffisent à représenter chaque type de phénomène (passages, occultations, éclipses, passages d'ombre, débuts ou fins) de chaque satellite pour une année entière avec une précision de l'ordre de la minute de temps.

Des explications sur cette méthode, le formulaire et les tables de coefficients sont donnés pages 42 à 45.

PHENOMENA OF THE GALILEAN SATELLITES OF JUPITER

The predictions of the phenomena of the Galilean Satellites are given as a polynomial representation which depends directly on time. The method (Thuillot, 1983) allows a compact representation as only 14 coefficients are sufficient to represent each type of phenomenon (transits, occultations, eclipses, shadow transits, beginnings or ends) for each satellite for a complete year with an accuracy of about one minute of time.

Some explanations about the method, the formulae and the tables of coefficients are given on pages 42 to 45.

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SATELLITES DE JUPITER
SATELLITES OF JUPITER

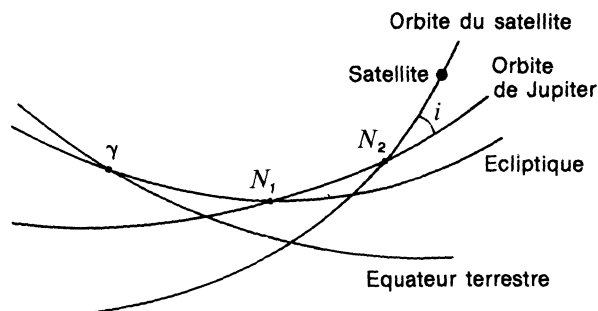
DONNÉES SUR LES SATELLITES GALILÉENS

DATA ON THE GALILEAN SATELLITES

	IO (I)	EUROPE (II)	GANYMÈDE (III)	CALLISTO (IV)
<i>Masses</i> (10^{-5} masse de Jupiter)				
Sampson (1921) :	4.50	2.54	7.99	4.50
De Sitter (1931) :	3.81	2.48	8.17	5.09
Pionner 11 (1976) :	4.68	2.52	7.80	5.66
<i>Rayons</i> (km)				
Danjon (1954) :	1650	1400	2450	2300
Dollfus (1961) :	1775	1550	2800	2525
Pionner 11 (1976) :	1840	1552	2650	2420
Voyager (1983) :	1816	1563	2638	2410
<i>Magnitudes visuelles</i> à l'opposition de Jupiter :				
Harris (1961) :	4.8	5.2	4.5	5.5
<i>Albedos géométriques</i> (Harris, 1961)				
<i>U</i> : 353 nm	0.19	0.47	0.29	0.14
<i>B</i> : 448 nm	0.56	0.67	0.41	0.21
<i>V</i> : 554 nm	0.92	0.83	0.49	0.26
<i>R</i> : 690 nm	1.12	0.93	0.56	0.30
<i>I</i> : 820 nm	1.15	0.95	0.57	0.31
<i>Albédo de Bond</i> (visuel)				
	0.54	0.49	0.29	0.15
<i>Demi-grand axe</i> (Sampson, 1921)				
en UA :	0.002820	0.004486	0.007155	0.012586
en rayons de Jupiter :	5.87	9.34	14.91	26.22
en kilomètres :	421810	671140	1070500	1882900
<i>Plus grande élongation</i> à l'opposition de Jupiter (minutes et secondes de degré)				
Sampson (1921) :	2' 17"	3' 40"	5' 48"	10' 13"
<i>Période synodique</i> (jours)				
Sampson (1921) :	1.7698604883	3.5540941742	7.1663872292	16.7535523007
<i>Inclinaison moyenne</i> sur l'équateur de Jupiter pour 1986.5 (minutes et secondes de degré)				
Sampson (1921) :	1' 20"	26' 30"	11' 15"	19' 57"
<i>Valeur moyenne de l'excentricité</i> pour 1986.5				
Sampson (1921) :	0.004	0.010	0.001	0.008
<i>Partie séculaire du mouvement</i> (degrés par an)				
nœud :	- 48.5	- 11.9	- 2.6	- 0.6
périjove :	57.0	14.6	2.7	0.7
Sampson (1921)				

**Théorie du mouvement
des satellites Galiléens**

**Theory of the motion of
the Galilean satellites**



(repère moyen de la date)
(mean frame of the date)

Du fait de la complexité du mouvement des satellites Galiléens, il est difficile de donner des valeurs précises sur les nœuds et les périjoves. En effet, les excentricités et les inclinaisons sont faibles (cf. tableau précédent) et tous ces éléments sont soumis à de grandes variations.

On donne ci-après les longitudes moyennes (d'après Sampson, 1921) dans le plan des orbites, ce plan étant confondu avec l'équateur de Jupiter.

Si \$\tau\$ est le temps en jours moyens compté à partir de 1900,0 on a :

Because of the complexity of the motion of the Galilean satellites of Jupiter it is difficult to provide precise values for nodes and perijoves. Indeed, eccentricities and inclinations are small (see the preceding table) and all these elements undergo large variations.

The mean longitudes (Sampson, 1921) in the orbital planes identified with Jupiter's equator are given below.

If \$\tau\$ is the time in days which has elapsed from 1900.0, one gets :

$$\gamma N_1 N_2 = 316.051^\circ + 0.00003559 \tau, \quad i = 3.10350^\circ$$

	$\gamma N_1 + N_1 N_2 + N_2 M$	Période sidérale en jours Sidereal period in days
Io	$142.59987^\circ + 203.488992435 \tau$	1.7691374639
Europe	$99.55081^\circ + 101.374761672 \tau$	3.5511797420
Ganymède	$168.02628^\circ + 50.317646290 \tau$	7.1545476894
Callisto	$234.40790^\circ + 21.571109630 \tau$	16.6889884746

DONNÉES SUR L'ENSEMBLE DES SATELLITES DE JUPITER

DATA ON THE GALILEAN AND OTHER SATELLITES OF JUPITER

NOM	masse	rayon	période rotation sidérale	albédo géométrique	magnitude visuelle	période orbitale	élongation maximale	1/2 grand axe	excentricité	inclinaison sur l'équateur de Jupiter
	unité → masse de Jupiter	km	jour			jour	(°) (') (")	10 ³ km		degré
I Io	4.70×10^{-5}	1 815	(S)	0.61	5.02	1.769 137	2 18	422	0.004	0.04
II Europa	2.56×10^{-5}	1 569	(S)	0.64	5.29	3.551 181	3 40	671	0.009	0.47
III Ganymède	7.84×10^{-5}	2 631	(S)	0.42	4.61	7.154 552	5 51	1 070	0.002	0.21
IV Callisto	5.6×10^{-5}	2 400	(S)	0.20	5.65	16.689 018	10 18	1 883	0.007	0.51
V Amalthea	$38. \times 10^{-10}$	135 × 85 × 75	(S)	0.05	14.1	0.498 179	59	181	0.003	0.40
VI Himalia	$50. \times 10^{-10}$	90	0.4	0.03	14.84	250.566 2	1 02 46	11 480	0.158	27.63 (1) (2)
VII Elara	$4. \times 10^{-10}$	40	0.5	0.03	16.77	259.652 8	1 04 10	11 737	0.207	24.77 (1) (2)
VIII Pasiphae	$1. \times 10^{-10}$				17.0	735. (R)	2 08 26	23 500	0.378	145. (1) (2)
IX Sinope	0.4×10^{-10}	15			18.3	758. (R)	2 09 31	23 700	0.275	153. (1) (2)
X Lysithea	0.4×10^{-10}	10			18.4	259.22	1 04 04	11 720	0.107	29.02 (2)
XI Carme	0.5×10^{-10}	15			18.0	692. (R)	2 03 31	22 600	0.207	164. (2)
XII Ananke	0.2×10^{-10}	10			18.9	631. (R)	1 55 52	21 200	0.169	147. (2)
XIII Leda	0.03×10^{-10}	8			20.	238.72	1 00 39	11 094	0.148	26.07 (2)
XIV Thebe	$4. \times 10^{-10}$	40		0.05	16.0	0.674 55	1 13	221		
XV Adrastea	0.1×10^{-10}	10		0.05	18.9	0.298	42	129		
XVI Metis	0.5×10^{-10}	20		0.05	17.5	0.294 79	42	128		

NAME	mass	radius	sidereal rotation	geometrical albedo	visual magnitude	orbital period	greatest elongation	semi major axis	eccentricity	inclination on Jupiter's equator
	unit → Jupiter's mass	km	day			day	(°) (') (")	10 ³ km		degree

NOTES

(S) : révolution synchrone

(R) : révolution rétrograde

(1) : les éphémérides des satellites VI, VII, VIII et IX sont données sous forme de coefficients de Tchébycheff dans le supplément à la Connaissance des Temps « Satellites faibles... »

(2) : inclinaison sur l'orbite de Jupiter

(S) : synchronous revolution

(R) : retrograde revolution

(1) : the ephemerides for satellites VI, VII, VIII and IX are given as Chebychev coefficients in the *Supplément à la Connaissance des Temps « Faint Satellites... »*

(2) : inclination on Jupiter's orbit

Données extraites de l'*Encyclopédie du Bureau des Longitudes*.Data from the *Encyclopédie du Bureau des Longitudes*.

ÉPHÉMÉRIDES DES SATELLITES GALILÉENS

EPHEMERIDES OF THE GALILEAN SATELLITES

Coordonnées différentielles tangentiels données en secondes de degré dans le repère équatorial moyen de la date. *Differential tangential coordinates given in arcsecond in the mean equatorial frame of the date.*

$$\begin{aligned} \Delta\alpha \cos\delta &= X \\ \Delta\delta &= Y \end{aligned}$$

$$\left. \begin{array}{l} X \\ Y \end{array} \right\} = A0 + A1 \cdot t + B0 \sin(Nt + F0) + B1 \cdot t \sin(Nt + F1) + B2 \cdot t^2 \sin(Nt + F2) + C0 \sin(2Nt + P0)$$

où $t = T - T0$ avec $T0$ date du début de l'intervalle et T date du calcul *where $t = T - T0$ with $T0$ date of beginning of the interval and T the date for the calculation*

satellite	intervalle Δt (jours)	N (rad/j)	page
Io	4	3.551 6	18
Europe	4	1.769 3	26
Ganymède	8	0.878 2	34
Callisto	8	0.376 5	38
	(days)	(rad/d)	

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES					
		DU SATELLITE 1 DE JUPITER: IO				N=3.5516	
		A0	A1	B0 FO	B1 F1	B2 F2	C0 PO
JAN. 1 (OH)	X:	+0.5953	-0.00273	+ 94.5903 4.749195	+0.41649 2.6910	+0.002886 3.8328	+0.1979 4.9074
(2446431.5)							
A JAN. 5 (OH)	Y:	+0.2170	-0.00027	+ 34.5796 4.754706	+0.13195 3.4880		+0.0725 4.9096
JAN. 5 (OH)	X:	+0.5871	-0.00289	+ 93.8466 0.089926	+0.41407 4.3588	+0.002374 5.2367	+0.1970 1.9373
(2446435.5)							
A JAN. 9 (OH)	Y:	+0.2173	-0.00045	+ 34.7407 0.097011	+0.13588 5.1353		+0.0730 1.9499
JAN. 9 (OH)	X:	+0.5833	-0.00519	+ 93.1593 1.713565	+0.41291 6.0219	+0.001910 0.5407	+0.1973 5.2444
(2446439.5)							
A JAN. 13 (OH)	Y:	+0.2193	-0.00128	+ 34.9174 1.722317	+0.14052 0.4916		+0.0747 5.2546
JAN. 13 (OH)	X:	+0.5668	-0.00309	+ 92.5281 3.336938	+0.40895 1.4001	+0.001767 1.5858	+0.1970 2.2810
(2446443.5)							
A JAN. 17 (OH)	Y:	+0.2156	-0.00041	+ 35.1076 3.347320	+0.14304 2.1316		+0.0753 2.2866
JAN. 17 (OH)	X:	+0.5546	-0.00368	+ 91.9561 4.960297	+0.42532 3.0591	+0.003014 0.0666	+0.1967 5.5865
(2446447.5)							
A JAN. 21 (OH)	Y:	+0.2139	-0.00074	+ 35.3113 4.972233	+0.14592 3.7670		+0.0762 5.5989
JAN. 21 (OH)	X:	+0.5368	-0.00180	+ 91.4324 0.300119	+0.42168 4.7095	+0.003356 1.5825	+0.1978 2.6169
(2446451.5)							
A JAN. 25 (OH)	Y:	+0.2095	+0.00002	+ 35.5262 0.313782	+0.14840 5.4049		+0.0773 2.6266
JAN. 25 (OH)	X:	+0.5219	-0.00352	+ 90.9584 1.922921	+0.40850 0.0789	+0.001653 3.0708	+0.1975 5.9232
(2446455.5)							
A JAN. 29 (OH)	Y:	+0.2062	-0.00071	+ 35.7507 1.938353	+0.15006 0.7672		+0.0780 5.9400
JAN. 29 (OH)	X:	+0.5051	-0.00361	+ 90.5475 3.545706	+0.40326 1.7113	+0.002810 3.8070	+0.1983 2.9481
(2446459.5)							
A FEV. 2 (OH)	Y:	+0.2020	-0.00079	+ 35.9882 3.562917	+0.15234 2.4064		+0.0795 2.9643
FEV. 1 (OH)	X:	+0.4886	-0.00441	+ 90.2643 1.621220	+0.40330 6.1123	+0.001735 2.6086	+0.1978 5.4318
(2446462.5)							
A FEV. 5 (OH)	Y:	+0.1976	-0.00112	+ 36.1738 1.639723	+0.15429 0.4892		+0.0796 5.4520
FEV. 5 (OH)	X:	+0.4670	-0.00374	+ 89.9425 3.243909	+0.39953 1.4722	+0.002625 3.8299	+0.1993 2.4549
(2446466.5)							
A FEV. 9 (OH)	Y:	+0.1912	-0.00093	+ 36.4298 3.264195	+0.15625 2.1302		+0.0813 2.4763
FEV. 9 (OH)	X:	+0.4473	-0.00713	+ 89.6688 4.866503	+0.38257 3.1312	+0.002536 3.7562	+0.1991 5.7654
(2446470.5)							
A FEV. 13 (OH)	Y:	+0.1853	-0.00231	+ 36.6985 4.888693	+0.15875 3.7614		+0.0815 5.7899
FEV. 13 (OH)	X:	+0.4249	-0.00776	+ 89.4436 0.206020	+0.37689 4.8049	+0.003354 4.8732	+0.1993 2.7864
(2446474.5)							
A FEV. 17 (OH)	Y:	+0.1787	-0.00279	+ 36.9745 0.230005	+0.16139 5.4029		+0.0829 2.8198
FEV. 17 (OH)	X:	+0.3953	-0.00848	+ 89.2809 1.828802	+0.38240 0.1728	+0.001590 0.7183	+0.1997 6.1012
(2446478.5)							
A FEV. 21 (OH)	Y:	+0.1693	-0.00305	+ 37.2641 1.854573	+0.16392 0.7542		+0.0840 6.1256

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES					
		DU SATELLITE 1 DE JUPITER:				IO	N=3.5516
		AO	A1	BO FO	B1 F1	B2 F2	CO PO
FEV.21 (OH) (2446482.5)	X:	+0.3703	-0.00940	+ 89.1714 3.451626	+0.38817 1.8331	+0.000870 5.2779	+0.2007 3.1230
A FEV.25 (OH)	Y:	+0.1607	-0.00349	+ 37.5655 3.479125	+0.16448 2.3874		+0.0849 3.1527
FEV.25 (OH) (2446486.5)	X:	+0.3315	-0.00627	+ 89.1150 5.074577	+0.39808 3.4802	+0.003915 0.1946	+0.2011 0.1542
A FEV.29 (OH)	Y:	+0.1466	-0.00222	+ 37.8752 5.103803	+0.16596 4.0259		+0.0861 0.1809
MAR. 1 (OH) (2446490.5)	X:	+0.3048	-0.00817	+ 89.1079 0.414248	+0.38977 5.1283	+0.003444 1.4411	+0.2017 3.4581
A MAR. 5 (OH)	Y:	+0.1367	-0.00302	+ 38.1953 0.445361	+0.16717 5.6663		+0.0865 3.4869
MAR. 5 (OH) (2446494.5)	X:	+0.2661	-0.00499	+ 89.1488 2.037188	+0.37802 0.5155	+0.001514 3.1279	+0.2035 0.4856
A MAR. 9 (OH)	Y:	+0.1214	-0.00177	+ 38.5251 2.070166	+0.16721 1.0302		+0.0882 0.5204
MAR. 9 (OH) (2446498.5)	X:	+0.2383	-0.00814	+ 89.2509 3.660360	+0.36940 2.1634	+0.001962 3.5132	+0.2031 3.7928
A MAR.13 (OH)	Y:	+0.1108	-0.00318	+ 38.8677 3.695227	+0.16866 2.6704		+0.0887 3.8256
MAR.13 (OH) (2446502.5)	X:	+0.2061	-0.00846	+ 89.3975 5.283657	+0.35495 3.8407	+0.004186 3.9672	+0.2046 0.8131
A MAR.17 (OH)	Y:	+0.0975	-0.00343	+ 39.2218 5.320474	+0.17038 4.3067		+0.0898 0.8560
MAR.17 (OH) (2446506.5)	X:	+0.1717	-0.01035	+ 89.6002 0.624162	+0.36364 5.5073	+0.002077 5.4552	+0.2043 4.1269
A MAR.21 (OH)	Y:	+0.0845	-0.00438	+ 39.5848 0.662757	+0.17246 5.9511		+0.0911 4.1682
MAR.21 (OH) (2446510.5)	X:	+0.1396	-0.01173	+ 89.8639 2.248071	+0.37349 0.8671	+0.001479 2.9133	+0.2054 1.1493
A MAR.25 (OH)	Y:	+0.0712	-0.00498	+ 39.9631 2.288410	+0.17313 1.3072		+0.0917 1.1915
MAR.25 (OH) (2446514.5)	X:	+0.0963	-0.00983	+ 90.1703 3.872117	+0.37690 2.5450	+0.002274 5.8745	+0.2069 4.4631
A MAR.29 (OH)	Y:	+0.0534	-0.00419	+ 40.3524 3.914247	+0.17270 2.9497		+0.0932 4.5087
MAR.29 (OH) (2446518.5)	X:	+0.0611	-0.01021	+ 90.5402 5.496442	+0.37846 4.1830	+0.003788 0.5121	+0.2075 1.4884
A AVR. 2 (OH)	Y:	+0.0386	-0.00441	+ 40.7518 5.540379	+0.17343 4.5988		+0.0936 1.5291
AVR. 1 (OH) (2446521.5)	X:	+0.0325	-0.01065	+ 90.8435 3.573212	+0.37168 2.3129	+0.001494 5.6654	+0.2089 3.9717
A AVR. 5 (OH)	Y:	+0.0259	-0.00466	+ 41.0613 3.618578	+0.17382 2.6886		+0.0949 4.0208
AVR. 5 (OH) (2446525.5)	X:	-0.0047	-0.01048	+ 91.3065 5.198088	+0.37666 3.9523	+0.003775 0.2435	+0.2094 0.9982
A AVR. 9 (OH)	Y:	+0.0101	-0.00467	+ 41.4830 5.245211	+0.17423 4.3405		+0.0953 1.0415

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES					
		DU SATELLITE 1 DE JUPITER:				IO	N=3.5516
		AO	A1	BO FO	B1 F1	B2 F2	CO PO
AVR. 9 (OH)	X:	-0.0491	-0.00777	+ 91.8220	+0.37089	+0.004485	+0.2121
(2446529.5)				0.540002	5.6038	1.4460	4.3085
A AVR. 13 (OH)	Y:	-0.0099	-0.00331	+ 41.9194	+0.17440		+0.0964
				0.588974	5.9911		4.3596
AVR. 13 (OH)	X:	-0.0847	-0.00838	+ 92.3824	+0.35898	+0.001319	+0.2124
(2446533.5)				2.165367	1.0196	2.4960	1.3359
A AVR. 17 (OH)	Y:	-0.0262	-0.00376	+ 42.3669	+0.17399		+0.0977
				2.216214	1.3685		1.3879
AVR. 17 (OH)	X:	-0.1248	-0.00704	+ 93.0060	+0.34998	+0.003067	+0.2142
(2446537.5)				3.791231	2.6863	3.1550	4.6474
A AVR. 21 (OH)	Y:	-0.0447	-0.00318	+ 42.8296	+0.17538		+0.0983
				3.843957	3.0195		4.6990
AVR. 21 (OH)	X:	-0.1567	-0.01017	+ 93.6754	+0.35123	+0.002984	+0.2142
(2446541.5)				5.417546	4.3730	4.2520	1.6763
A AVR. 25 (OH)	Y:	-0.0594	-0.00474	+ 43.3073	+0.17591		+0.0992
				5.472070	4.6696		1.7355
AVR. 25 (OH)	X:	-0.1943	-0.00949	+ 94.3981	+0.36351	+0.001120	+0.2163
(2446545.5)				0.761171	6.0495	4.6223	4.9886
A AVR. 29 (OH)	Y:	-0.0764	-0.00453	+ 43.7974	+0.17690		+0.1006
				0.817414	0.0436		5.0434
AVR. 29 (OH)	X:	-0.2285	-0.01202	+ 95.1908	+0.36341	+0.001673	+0.2172
(2446549.5)				2.388402	1.4033	2.8517	2.0227
A MAI 3 (OH)	Y:	-0.0925	-0.00560	+ 44.3059	+0.17689		+0.1015
				2.446362	1.6983		2.0813
MAI 1 (OH)	X:	-0.2581	-0.00584	+ 95.5995	+0.35447	+0.001856	+0.2190
(2446551.5)				3.202021	2.2573	2.8443	3.6738
A MAI 5 (OH)	Y:	-0.1063	-0.00276	+ 44.5630	+0.17579		+0.1021
				3.260899	2.5411		3.7307
MAI 5 (OH)	X:	-0.2868	-0.00935	+ 96.4633	+0.35110	+0.003089	+0.2194
(2446555.5)				4.829922	3.9400	3.8754	0.7048
A MAI 9 (OH)	Y:	-0.1204	-0.00448	+ 45.0936	+0.17671		+0.1025
				4.890597	4.1944		0.7694
MAI 9 (OH)	X:	-0.3241	-0.00773	+ 97.3736	+0.36033	+0.002032	+0.2209
(2446559.5)				0.175210	5.6268	4.8364	4.0185
A MAI 13 (OH)	Y:	-0.1376	-0.00386	+ 45.6368	+0.17777		+0.1040
				0.237563	5.8599		4.0818
MAI 13 (OH)	X:	-0.3538	-0.01137	+ 98.3489	+0.36783	+0.002008	+0.2225
(2446563.5)				1.804287	0.9831	2.7512	1.0536
A MAI 17 (OH)	Y:	-0.1523	-0.00544	+ 46.1984	+0.17782		+0.1048
				1.868232	1.2437		1.1208
MAI 17 (OH)	X:	-0.3885	-0.00956	+ 99.3752	+0.37193	+0.003716	+0.2238
(2446567.5)				3.433868	2.6447	4.7678	4.3672
A MAI 21 (OH)	Y:	-0.1689	-0.00478	+ 46.7780	+0.17667		+0.1062
				3.499449	2.9073		4.4332
MAI 21 (OH)	X:	-0.4261	-0.00878	+100.4484	+0.37761	+0.005994	+0.2261
(2446571.5)				5.064062	4.3074	0.2158	1.4065
A MAI 25 (OH)	Y:	-0.1861	-0.00432	+ 47.3681	+0.17675		+0.1062
				5.131189	4.5881		1.4681
MAI 25 (OH)	X:	-0.4562	-0.00790	+101.5728	+0.36502	+0.004032	+0.2272
(2446575.5)				0.411510	6.0080	1.3068	4.7193
A MAI 29 (OH)	Y:	-0.2018	-0.00380	+ 47.9761	+0.17713		+0.1069
				0.480358	6.2641		4.7932

1986

COORDONNEES EQUATORIALES DIFFERENTIELLES

		DU SATELLITE 1 DE JUPITER: IO				N=3.5516	
		A0	A1	B0 FO	B1 F1	B2 F2	C0 PO
MAI 29 (OH) (2446579.5)	X:	-0.4958	-0.00406	+102.7415 2.042792	+0.35909 1.4542	+0.001507 1.5857	+0.2305 1.7570
A JUN. 2 (OH)	Y:	-0.2216	-0.00204	+ 48.5990 2.113293	+0.17682 1.6649		+0.1092 1.8267
JUN. 1 (OH) (2446582.5)	X:	-0.5080	-0.00757	+103.6536 0.125378	+0.36888 5.8090	+0.004583 1.2014	+0.2304 4.2430
A JUN. 5 (OH)	Y:	-0.2276	-0.00369	+ 49.0765 0.196944	+0.17812 6.0586		+0.1085 4.3178
JUN. 5 (OH) (2446586.5)	X:	-0.5453	-0.00386	+104.9075 1.757846	+0.35946 1.2613	+0.001928 1.5632	+0.2329 1.2837
A JUN. 9 (OH)	Y:	-0.2466	-0.00195	+ 49.7269 1.831004	+0.17739 1.4654		+0.1108 1.3567
JUN. 9 (OH) (2446590.5)	X:	-0.5657	-0.00545	+106.2033 3.391293	+0.36342 2.9418	+0.001645 3.4680	+0.2330 4.6047
A JUN.13 (OH)	Y:	-0.2576	-0.00287	+ 50.3904 3.465915	+0.17863 3.1423		+0.1105 4.6788
JUN.13 (OH) (2446594.5)	X:	-0.5951	-0.00304	+107.5366 5.025433	+0.36548 4.6424	+0.001787 4.3397	+0.2355 1.6392
A JUN.17 (OH)	Y:	-0.2725	-0.00178	+ 51.0668 5.101498	+0.17960 4.8228		+0.1118 1.7180
JUN.17 (OH) (2446598.5)	X:	-0.6111	-0.00634	+108.9048 0.377183	+0.37430 0.0483	+0.000631 3.6632	+0.2362 4.9689
A JUN.21 (OH)	Y:	-0.2813	-0.00340	+ 51.7554 0.454585	+0.17957 0.2284		+0.1122 5.0463
JUN.21 (OH) (2446602.5)	X:	-0.6316	-0.00593	+110.3185 2.013055	+0.37382 1.6797	+0.005537 3.4628	+0.2375 2.0052
A JUN.25 (OH)	Y:	-0.2930	-0.00317	+ 52.4556 2.091630	+0.17906 1.9195		+0.1136 2.0876
JUN.25 (OH) (2446606.5)	X:	-0.6513	-0.00717	+111.7460 3.649570	+0.37632 3.3785	+0.006022 5.2706	+0.2395 5.3366
A JUN.29 (OH)	Y:	-0.3026	-0.00390	+ 53.1646 3.729403	+0.17771 3.6126		+0.1150 5.4084
JUN.29 (OH) (2446610.5)	X:	-0.6700	-0.00551	+113.1958 5.286870	+0.37430 5.0930	+0.005583 0.5751	+0.2411 2.3770
A JUL. 3 (OH)	Y:	-0.3119	-0.00297	+ 53.8720 5.367901	+0.18002 5.3217		+0.1142 2.4557
JUL. 1 (OH) (2446612.5)	X:	-0.6805	-0.00394	+113.9254 6.105812	+0.37403 5.9961	+0.000435 3.6677	+0.2413 4.0395
A JUL. 5 (OH)	Y:	-0.3188	-0.00231	+ 54.2304 6.187546	+0.17991 6.1591		+0.1149 4.1209
JUL. 5 (OH) (2446616.5)	X:	-0.6961	-0.00345	+115.4025 1.461456	+0.37586 1.3544	+0.006196 3.2147	+0.2429 1.0786
A JUL. 9 (OH)	Y:	-0.3286	-0.00201	+ 54.9482 1.544100	+0.17867 1.5847		+0.1162 1.1696
JUL. 9 (OH) (2446620.5)	X:	-0.7046	-0.00605	+116.8867 3.100995	+0.36854 3.0651	+0.006082 4.7694	+0.2446 4.4162
A JUL.13 (OH)	Y:	-0.3335	-0.00340	+ 55.6656 3.184700	+0.17637 3.2841		+0.1177 4.4988
JUL.13 (OH) (2446624.5)	X:	-0.7191	-0.00368	+118.3570 4.741401	+0.36657 4.7858	+0.005885 0.1195	+0.2454 1.4605
A JUL.17 (OH)	Y:	-0.3403	-0.00225	+ 56.3699 4.825986	+0.17698 5.0056		+0.1162 1.5406

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES					
		DU SATELLITE 1 DE JUPITER:				ID	N=3.5516
		AO	A1	BO FO	B1 F1	B2 F2	CO PO
JUL.17 (OH)	X:	-0.7313	-0.00338	+119.8198	+0.35804	+0.006578	+0.2483
(2446628.5)				0.099522	0.2233	1.5122	4.7914
A JUL.21 (OH)	Y:	-0.3488	-0.00165	+ 57.0679	+0.17557		+0.1173
				0.184983	0.4346		4.8839
JUL.21 (OH)	X:	-0.7406	-0.00017	+121.2536	+0.36454	+0.001376	+0.2481
(2446632.5)				1.741619	1.9980	3.9228	1.8436
A JUL.25 (OH)	Y:	-0.3552	-0.00045	+ 57.7488	+0.17371		+0.1181
				1.827919	2.1540		1.9321
JUL.25 (OH)	X:	-0.7516	+0.00177	+122.6474	+0.37051	+0.002438	+0.2496
(2446636.5)				3.384723	3.7260	0.6644	5.1740
A JUL.29 (OH)	Y:	-0.3612	+0.00053	+ 58.4071	+0.17148		+0.1190
				3.471703	3.8639		5.2639
JUL.29 (OH)	X:	-0.7474	+0.00055	+124.0038	+0.36515	+0.001959	+0.2490
(2446640.5)				5.028699	5.4375	1.7986	2.2308
A ADU. 2 (OH)	Y:	-0.3612	-0.00010	+ 59.0387	+0.16907		+0.1189
				5.116223	5.5804		2.3147
ADU. 1 (OH)	X:	-0.7561	+0.00253	+124.9840	+0.36852	+0.003394	+0.2510
(2446643.5)				3.120536	3.6101	0.4027	4.7289
A ADU. 5 (OH)	Y:	-0.3658	+0.00089	+ 59.4941	+0.16612		+0.1197
				3.208412	3.7490		4.8207
ADU. 5 (OH)	X:	-0.7488	+0.00174	+126.2328	+0.35998	+0.002739	+0.2498
(2446647.5)				4.765947	5.3274	1.6564	1.7860
A ADU. 9 (OH)	Y:	-0.3643	+0.00051	+ 60.0625	+0.16274		+0.1194
				4.854176	5.4743		1.8709
ADU. 9 (OH)	X:	-0.7520	+0.00428	+127.4028	+0.35382	+0.004944	+0.2504
(2446651.5)				0.128904	0.7583	2.9075	5.1242
A ADU.13 (OH)	Y:	-0.3682	+0.00172	+ 60.5926	+0.15696		+0.1181
				0.217324	0.9481		5.2135
ADU.13 (OH)	X:	-0.7333	-0.00138	+128.4836	+0.33098	+0.007686	+0.2500
(2446655.5)				1.775837	2.4624	3.9050	2.1863
A ADU.17 (OH)	Y:	-0.3611	-0.00111	+ 61.0642	+0.15279		+0.1192
				1.864308	2.6936		2.2827
ADU.17 (OH)	X:	-0.7329	+0.00197	+129.4541	+0.32186	+0.007271	+0.2504
(2446659.5)				3.423226	4.2225	5.4482	5.5238
A ADU.21 (OH)	Y:	-0.3601	+0.00034	+ 61.4816	+0.14778		+0.1199
				3.511730	4.4628		5.6019
ADU.21 (OH)	X:	-0.7187	-0.00120	+130.3015	+0.32530	+0.007505	+0.2513
(2446663.5)				5.071099	5.9765	1.0847	2.5840
A ADU.25 (OH)	Y:	-0.3546	-0.00062	+ 61.8272	+0.14695		+0.1188
				5.159545	6.2260		2.6628
ADU.25 (OH)	X:	-0.7129	+0.00280	+131.0367	+0.32865	+0.003797	+0.2493
(2446667.5)				0.436238	1.4984	3.0765	5.9223
A ADU.29 (OH)	Y:	-0.3546	+0.00122	+ 62.1130	+0.14430		+0.1176
				0.524535	1.7336		6.0137
ADU.29 (OH)	X:	-0.7061	+0.00518	+131.6242	+0.34603	+0.006945	+0.2504
(2446671.5)				2.084956	3.2704	6.0044	2.9807
A SEP. 2 (OH)	Y:	-0.3504	+0.00217	+ 62.3213	+0.13866		+0.1179
				2.173124	3.5149		3.0811
SEP. 1 (OH)	X:	-0.6877	+0.00328	+131.9773	+0.31932	+0.004235	+0.2478
(2446674.5)				0.180255	1.4388	2.9857	5.4912
A SEP. 5 (OH)	Y:	-0.3444	+0.00152	+ 62.4289	+0.13980		+0.1164
				0.267957	1.7211		5.5809

1986

COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 1 DE JUPITER: IO

N=3.5516

		AO	A1	BO FO	B1 F1	B2 F2	CO PO
SEP. 5 (OH) (2446678.5)	X:	-0.6775	+0.00561	+132.3103 1.829372	+0.33848 3.2195	+0.007402 5.8820	+0.2487 2.5507
A SEP. 9 (OH)	Y:	-0.3384	+0.00241	+ 62.4966 1.916779	+0.13590 3.5145		+0.1162 2.6490
SEP. 9 (OH) (2446682.5)	X:	-0.6568	+0.00670	+132.4816 3.478805	+0.32086 4.9661	+0.006718 0.9924	+0.2448 5.8963
A SEP. 13 (OH)	Y:	-0.3288	+0.00309	+ 62.4825 3.565530	+0.13536 5.3058		+0.1160 5.9890
SEP. 13 (OH) (2446686.5)	X:	-0.6418	+0.00961	+132.5005 5.128135	+0.30515 0.4537	+0.005649 2.3160	+0.2438 2.9541
A SEP. 17 (OH)	Y:	-0.3241	+0.00466	+ 62.3899 5.214203	+0.13424 0.8212		+0.1148 3.0274
SEP. 17 (OH) (2446690.5)	X:	-0.6099	+0.00622	+132.3622 0.494040	+0.30060 2.2142	+0.008075 3.8590	+0.2422 0.0248
A SEP. 21 (OH)	Y:	-0.3102	+0.00268	+ 62.2203 0.579298	+0.13984 2.6207		+0.1127 0.1097
SEP. 21 (OH) (2446694.5)	X:	-0.5867	+0.00730	+132.0788 2.143016	+0.28281 4.0595	+0.005700 4.8416	+0.2390 3.3653
A SEP. 25 (OH)	Y:	-0.2983	+0.00315	+ 61.9726 2.227430	+0.14148 4.4176		+0.1127 3.4574
SEP. 25 (OH) (2446698.5)	X:	-0.5539	+0.00374	+131.6297 3.791466	+0.28725 5.8562	+0.004185 0.1191	+0.2381 0.4317
A SEP. 29 (OH)	Y:	-0.2822	+0.00162	+ 61.6486 3.874976	+0.14679 6.1833		+0.1115 0.5093
SEP. 29 (OH) (2446702.5)	X:	-0.5281	+0.00580	+131.0266 5.439332	+0.30225 1.3065	+0.004862 2.6485	+0.2346 3.7739
A OCT. 3 (OH)	Y:	-0.2717	+0.00285	+ 61.2557 5.522037	+0.15122 1.6588		+0.1091 3.8482
OCT. 1 (OH) (2446704.5)	X:	-0.5192	+0.00911	+130.6778 6.263160	+0.30705 2.1770	+0.007723 3.8579	+0.2332 5.4544
A OCT. 5 (OH)	Y:	-0.2682	+0.00410	+ 61.0388 0.062228	+0.15333 2.5545		+0.1082 5.5296
OCT. 5 (OH) (2446708.5)	X:	-0.4888	+0.00906	+129.8796 1.627260	+0.29529 4.0277	+0.004659 4.6056	+0.2303 2.5090
A OCT. 9 (OH)	Y:	-0.2529	+0.00408	+ 60.5551 1.708467	+0.15664 4.3179		+0.1073 2.5966
OCT. 9 (OH) (2446712.5)	X:	-0.4496	+0.00551	+128.9500 3.273645	+0.30572 5.8178	+0.002887 5.8562	+0.2289 5.8586
A OCT. 13 (OH)	Y:	-0.2341	+0.00245	+ 60.0188 3.353854	+0.16102 6.0586		+0.1067 5.9340
OCT. 13 (OH) (2446716.5)	X:	-0.4188	+0.00717	+127.8987 4.919083	+0.32057 1.2334	+0.004109 2.5437	+0.2251 2.9149
A OCT. 17 (OH)	Y:	-0.2204	+0.00345	+ 59.4355 4.998418	+0.16415 1.5026		+0.1048 2.9866
OCT. 17 (OH) (2446720.5)	X:	-0.3835	+0.00554	+126.7599 0.280644	+0.33805 2.9892	+0.004188 4.8454	+0.2233 6.2573
A OCT. 21 (OH)	Y:	-0.2038	+0.00259	+ 58.8179 0.359008	+0.16743 3.2315		+0.1033 0.0434
OCT. 21 (OH) (2446724.5)	X:	-0.3546	+0.01028	+125.5183 1.924480	+0.34357 4.6987	+0.008483 0.1068	+0.2199 3.3156
A OCT. 25 (OH)	Y:	-0.1884	+0.00470	+ 58.1727 2.002008	+0.17074 4.9792		+0.1012 3.4031

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES					
		DU SATELLITE 1 DE JUPITER: IO				N=3.5516	
		A0	A1	B0 FO	B1 F1	B2 F2	C0 PO
OCT.25 (OH)	X:	-0.3212	+0.01027	+124.1938	+0.33957	+0.009186	+0.2167
(2446728.5)				3.567450	0.1588	1.5732	0.3700
A OCT.29 (OH)	Y:	-0.1741	+0.00515	+ 57.4965	+0.17049		+0.1016
				3.644012	0.4180		0.4572
OCT.29 (OH)	X:	-0.2826	+0.01226	+122.8227	+0.35372	+0.005681	+0.2135
(2446732.5)				5.209462	1.9340	3.4078	3.7169
A NOV. 2 (OH)	Y:	-0.1573	+0.00571	+ 56.8140	+0.17378		+0.0990
				5.285118	2.1456		3.7856
NOV. 1 (OH)	X:	-0.2544	+0.01001	+121.7466	+0.35477	+0.009200	+0.2120
(2446735.5)				3.298595	0.0525	1.4374	6.2171
A NOV. 5 (OH)	Y:	-0.1427	+0.00500	+ 56.2885	+0.17375		+0.0988
				3.373651	0.2839		0.0228
NOV. 5 (OH)	X:	-0.2155	+0.01228	+120.2885	+0.36711	+0.005281	+0.2093
(2446739.5)				4.938850	1.8174	3.1780	3.2798
A NOV. 9 (OH)	Y:	-0.1259	+0.00577	+ 55.5912	+0.17572		+0.0971
				5.013096	2.0056		3.3470
NOV. 9 (OH)	X:	-0.1802	+0.01227	+118.8005	+0.37716	+0.002645	+0.2068
(2446743.5)				0.294885	3.5670	4.3198	0.3300
A NOV. 13 (OH)	Y:	-0.1085	+0.00566	+ 54.8942	+0.17795		+0.0953
				0.368311	3.7084		0.4010
NOV. 13 (OH)	X:	-0.1299	+0.00868	+117.2895	+0.39242	+0.002002	+0.2042
(2446747.5)				1.933126	5.3161	3.7827	3.6767
A NOV. 17 (OH)	Y:	-0.0853	+0.00402	+ 54.1999	+0.17857		+0.0944
				2.005807	5.4156		3.7454
NOV. 17 (OH)	X:	-0.0958	+0.00997	+115.7670	+0.40182	+0.001449	+0.2018
(2446751.5)				3.570141	0.7047	3.5214	0.7235
A NOV. 21 (OH)	Y:	-0.0693	+0.00465	+ 53.5132	+0.17765		+0.0932
				3.642306	0.8314		0.7983
NOV. 21 (OH)	X:	-0.0472	+0.00535	+114.2399	+0.39885	+0.002775	+0.2009
(2446755.5)				5.206153	2.3724	3.7112	4.0618
A NOV. 25 (OH)	Y:	-0.0468	+0.00253	+ 52.8413	+0.17775		+0.0932
				5.277871	2.5197		4.1309
NOV. 25 (OH)	X:	-0.0164	+0.00915	+112.7292	+0.40806	+0.004492	+0.1970
(2446759.5)				0.558163	4.0558	5.6778	1.1121
A NOV. 29 (OH)	Y:	-0.0311	+0.00423	+ 52.1827	+0.17763		+0.0904
				0.629511	4.2258		1.1775
NOV. 29 (OH)	X:	+0.0212	+0.00838	+111.2221	+0.40197	+0.007777	+0.1955
(2446763.5)				2.192345	5.7267	0.7387	4.4388
A DEC. 3 (OH)	Y:	-0.0126	+0.00411	+ 51.5438	+0.17896		+0.0903
				2.263432	5.9238		4.5196
DEC. 1 (OH)	X:	+0.0386	+0.01029	+110.4853	+0.42241	+0.001991	+0.1944
(2446765.5)				3.009330	0.3617	3.8124	6.1117
A DEC. 5 (OH)	Y:	-0.0060	+0.00487	+ 51.2304	+0.17863		+0.0899
				3.080084	0.4865		6.1829
DEC. 5 (OH)	X:	+0.0868	+0.00571	+109.0237	+0.41928	+0.002666	+0.1934
(2446769.5)				4.642039	2.0082	3.8224	3.1612
A DEC. 9 (OH)	Y:	+0.0167	+0.00271	+ 50.6220	+0.17854		+0.0902
				4.712674	2.1655		3.2321
DEC. 9 (OH)	X:	+0.1175	+0.00804	+107.5907	+0.41919	+0.002890	+0.1908
(2446773.5)				6.274055	3.6891	5.2384	0.2051
A DEC. 13 (OH)	Y:	+0.0321	+0.00381	+ 50.0323	+0.17808		+0.0885
				0.061396	3.8532		0.2683

ÉPHÉMÉRIDES DES SATELLITES NATURELS

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES					
		DU SATELLITE 2 DE JUPITER: EUROPE					N=1.7693
		AO	A1	BO FO	B1 F1	B2 F2	CO PO
JAN. 1 (OH)	X:	-0.5191	-0.73360	+151.7042 4.733740	+2.20693 2.3138	+0.346777 5.7737	+0.7200 1.6077
(2446431.5)							
A JAN. 5 (OH)	Y:	-0.7993	+0.01769	+ 55.9698 4.726083	+0.22119 3.5321		+0.2550 1.5643
JAN. 5 (OH)	X:	-2.6501	+0.28703	+148.6489 5.518238	+0.83135 4.2908	+0.135158 2.3378	+0.6663 3.2254
(2446435.5)							
A JAN. 9 (OH)	Y:	-0.7622	-0.00073	+ 56.2582 5.505776	+0.20296 4.2960		+0.2529 3.1804
JAN. 9 (OH)	X:	-2.2970	+0.19248	+147.7227 0.011217	+0.76898 4.8976	+0.102750 3.2038	+0.6610 4.8562
(2446439.5)							
A JAN. 13 (OH)	Y:	-0.7397	-0.00873	+ 56.5254 0.002701	+0.20703 5.1287		+0.2540 4.8198
JAN. 13 (OH)	X:	-1.3663	-0.30521	+146.4079 0.784079	+0.27672 3.7430	+0.145849 6.0724	+0.6318 0.1691
(2446443.5)							
A JAN. 17 (OH)	Y:	-0.7686	+0.00615	+ 56.8652 0.783099	+0.21416 5.8608		+0.2531 0.1460
JAN. 17 (OH)	X:	-2.7842	+0.45227	+146.8099 1.563925	+1.46587 5.6150	+0.194687 2.7769	+0.6217 1.7634
(2446447.5)							
A JAN. 21 (OH)	Y:	-0.7436	-0.00046	+ 57.1782 1.562908	+0.22016 0.4024		+0.2530 1.7839
JAN. 21 (OH)	X:	-0.6702	-0.57923	+144.3272 2.349171	+1.25062 1.7271	+0.271946 5.8966	+0.6595 3.3482
(2446451.5)							
A JAN. 25 (OH)	Y:	-0.7697	+0.02082	+ 57.5457 2.342330	+0.21099 1.1403		+0.2556 3.3917
JAN. 25 (OH)	X:	-2.3179	+0.24719	+144.1552 3.115843	+0.40336 0.1729	+0.117730 2.3842	+0.6538 5.0311
(2446455.5)							
A JAN. 29 (OH)	Y:	-0.7062	-0.00420	+ 57.9095 3.122468	+0.23296 1.9443		+0.2563 5.0412
JAN. 29 (OH)	X:	-2.0185	+0.21107	+143.6188 3.894966	+0.56975 1.2874	+0.126853 3.5452	+0.6599 0.3744
(2446459.5)							
A FEV. 2 (OH)	Y:	-0.6943	-0.00252	+ 58.2958 3.902233	+0.24665 2.7088		+0.2573 0.3766
FEV. 1 (OH)	X:	-1.8376	+0.06718	+143.0992 2.907557	+0.38541 0.9135	+0.054612 1.7085	+0.6379 4.7286
(2446462.5)							
A FEV. 5 (OH)	Y:	-0.6803	+0.00093	+ 58.5853 2.915608	+0.23811 1.7723		+0.2571 4.7470
FEV. 5 (OH)	X:	-2.3664	+0.44668	+142.3825 3.681467	+0.54899 0.2928	+0.210910 3.1198	+0.6587 0.0688
(2446466.5)							
A FEV. 9 (OH)	Y:	-0.6420	-0.00720	+ 59.0241 3.695423	+0.25684 2.4979		+0.2598 0.0825
FEV. 9 (OH)	X:	-0.6116	-0.43975	+143.1468 4.464164	+1.51006 2.4543	+0.208395 5.9162	+0.6413 1.7392
(2446470.5)							
A FEV. 13 (OH)	Y:	-0.6554	+0.01292	+ 59.4052 4.474382	+0.25210 3.4002		+0.2607 1.7214
FEV. 13 (OH)	X:	-2.4307	+0.49907	+141.1025 5.245575	+1.17612 4.6223	+0.211915 2.5002	+0.6123 3.3962
(2446474.5)							
A FEV. 17 (OH)	Y:	-0.6069	+0.00878	+ 59.8634 5.253305	+0.25247 4.1744		+0.2602 3.3571
FEV. 17 (OH)	X:	-0.8904	-0.18282	+141.5702 6.013709	+0.39637 3.4786	+0.094906 5.5534	+0.5973 4.9579
(2446478.5)							
A FEV. 21 (OH)	Y:	-0.5821	+0.00837	+ 60.3371 6.032693	+0.25323 4.9630		+0.2621 4.9679

1986

COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 2 DE JUPITER: EUROPE

N=1.7693

		A0	A1	B0 FO	B1 F1	B2 F2	C0 PO
FEV.21 (OH) (2446482.5)	X:	-1.0809	-0.06445	+141.4089 0.509681	+0.50232 4.8628	+0.048914 0.3176	+0.5985 0.3138
A FEV.25 (OH)	Y:	-0.5300	+0.00537	+ 60.8178 0.528422	+0.25183 5.7612		+0.2633 0.3296
FEV.25 (OH) (2446486.5)	X:	-1.6083	+0.29648	+141.7588 1.289346	+1.08418 5.8729	+0.118975 3.1711	+0.6033 1.8952
A FEV.29 (OH)	Y:	-0.5254	+0.01982	+ 61.3451 1.307976	+0.25437 0.2218		+0.2657 1.9472
MAR. 1 (OH) (2446490.5)	X:	-0.1120	-0.42766	+140.5388 2.068512	+0.96996 1.6666	+0.202735 5.9555	+0.6241 3.5215
A MAR. 5 (OH)	Y:	-0.4737	+0.01910	+ 61.8524 2.086861	+0.24739 1.0342		+0.2684 3.5792
MAR. 5 (OH) (2446494.5)	X:	-2.0941	+0.60520	+141.5241 2.833693	+0.95367 5.7668	+0.270464 2.6056	+0.6528 5.1894
A MAR. 9 (OH)	Y:	-0.3773	-0.00655	+ 62.4098 2.867719	+0.28796 1.7608		+0.2732 5.2150
MAR. 9 (OH) (2446498.5)	X:	-0.4457	-0.10712	+141.8133 3.621091	+0.93818 1.9551	+0.076627 5.1518	+0.6221 0.5535
A MAR.13 (OH)	Y:	-0.3621	+0.00805	+ 62.9257 3.646377	+0.26869 2.6345		+0.2719 0.5618
MAR.13 (OH) (2446502.5)	X:	-0.0406	-0.29622	+142.3243 4.398883	+1.28622 2.7060	+0.168382 6.1201	+0.6347 2.1960
A MAR.17 (OH)	Y:	-0.3580	+0.03470	+ 63.4610 4.426397	+0.28889 3.4733		+0.2770 2.1995
MAR.17 (OH) (2446506.5)	X:	-1.1883	+0.36806	+141.4544 5.176986	+0.84430 4.7163	+0.152271 2.8480	+0.6046 3.8230
A MAR.21 (OH)	Y:	-0.2580	+0.00768	+ 64.0851 5.205703	+0.26744 4.2405		+0.2770 3.8216
MAR.21 (OH) (2446510.5)	X:	+0.3520	-0.32915	+142.5730 5.946808	+0.48911 3.0791	+0.156474 5.8316	+0.5927 5.4332
A MAR.25 (OH)	Y:	-0.2002	+0.01185	+ 64.6980 5.985548	+0.26974 5.0308		+0.2794 5.4636
MAR.25 (OH) (2446514.5)	X:	-1.1254	+0.45207	+143.4466 0.452246	+1.43884 5.3706	+0.186934 2.7163	+0.6147 0.7143
A MAR.29 (OH)	Y:	-0.1485	+0.00733	+ 65.3162 0.482815	+0.27154 5.8504		+0.2819 0.7885
MAR.29 (OH) (2446518.5)	X:	+0.0770	-0.04125	+143.2920 1.225457	+0.60153 0.3361	+0.050807 5.0372	+0.6249 2.3827
A AVR. 2 (OH)	Y:	-0.0983	+0.01774	+ 65.9890 1.262950	+0.26600 0.3215		+0.2866 2.4399
AVR. 1 (OH) (2446521.5)	X:	-0.6551	+0.32646	+144.2838 0.242480	+1.20974 5.2585	+0.135133 2.5945	+0.6228 0.4360
A AVR. 5 (OH)	Y:	-0.0413	+0.00596	+ 66.4589 0.277861	+0.27292 5.6859		+0.2884 0.5041
AVR. 5 (OH) (2446525.5)	X:	-0.0341	+0.13404	+144.8205 1.017881	+0.80042 6.0848	+0.060673 3.4646	+0.6245 2.0906
A AVR. 9 (OH)	Y:	+0.0145	+0.01401	+ 67.1645 1.058565	+0.27128 0.1634		+0.2920 2.1542

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES					
		DU SATELLITE 2 DE JUPITER: EUROPE					N=1.7693
		A0	A1	B0 FO	B1 F1	B2 F2	C0 PO
AVR. 9 (OH)	X:	+1.1530	-0.45928	+144.6271	+0.98165	+0.238742	+0.6588
(2446529.5)				1.797421	1.8987	6.1663	3.6902
A AVR. 13 (OH)	Y:	+0.0365	+0.03361	+ 67.8941	+0.27191		+0.2959
				1.840028	0.9088		3.7727
AVR. 13 (OH)	X:	-0.5658	+0.50211	+146.8431	+0.72761	+0.221414	+0.6704
(2446533.5)				2.568960	5.9361	2.6963	5.3716
A AVR. 17 (OH)	Y:	+0.1733	-0.00384	+ 68.5972	+0.29175		+0.3015
				2.621874	1.7414		5.4175
AVR. 17 (OH)	X:	+1.3415	-0.33386	+147.8795	+1.47681	+0.181693	+0.6654
(2446537.5)				3.360646	2.0399	5.4674	0.7610
A AVR. 21 (OH)	Y:	+0.1781	+0.02381	+ 69.3166	+0.29616		+0.3036
				3.403544	2.5841		0.7755
AVR. 21 (OH)	X:	+0.6002	+0.03435	+148.3332	+0.68088	+0.034991	+0.6511
(2446541.5)				4.135419	3.2727	1.1193	2.3634
A AVR. 25 (OH)	Y:	+0.2503	+0.01832	+ 70.0887	+0.28608		+0.3081
				4.185418	3.4200		2.3969
AVR. 25 (OH)	X:	+0.2083	+0.34095	+149.0340	+0.84543	+0.132839	+0.6532
(2446545.5)				4.916468	4.6958	2.8466	4.0191
A AVR. 29 (OH)	Y:	+0.3296	+0.01682	+ 70.9019	+0.28426		+0.3115
				4.967785	4.2105		4.0447
AVR. 29 (OH)	X:	+1.6505	-0.35186	+151.2231	+0.51757	+0.167159	+0.6405
(2446549.5)				5.692105	3.2501	6.0489	5.5972
A MAI 3 (OH)	Y:	+0.3900	+0.01183	+ 71.7189	+0.28091		+0.3158
				5.750851	5.0339		5.6609
MAI 1 (OH)	X:	+0.8446	+0.15557	+151.7434	+0.64425	+0.104851	+0.6965
(2446551.5)				2.845151	1.3330	3.6636	0.1577
A MAI 5 (OH)	Y:	+0.4364	+0.00568	+ 72.1470	+0.30555		+0.3201
				3.001649	2.2211		0.2015
MAI 5 (OH)	X:	+1.7428	-0.29716	+153.2056	+1.21099	+0.149537	+0.6916
(2446555.5)				3.730304	2.6011	6.0472	1.8031
A MAI 9 (OH)	Y:	+0.4665	+0.02123	+ 72.9698	+0.29054		+0.3251
				3.784522	3.1347		1.8367
MAI 9 (OH)	X:	+0.2509	+0.52834	+153.2715	+1.12164	+0.210535	+0.6773
(2446559.5)				4.508865	4.7402	2.6699	3.4595
A MAI 13 (OH)	Y:	+0.5394	+0.02131	+ 73.8724	+0.29211		+0.3288
				4.568591	3.9218		3.4806
MAI 13 (OH)	X:	+2.3466	-0.45939	+156.6029	+0.75883	+0.214419	+0.6679
(2446563.5)				5.287340	2.8668	5.8976	5.0156
A MAI 17 (OH)	Y:	+0.6003	+0.01596	+ 74.7813	+0.28820		+0.3328
				5.353263	4.7500		5.0972
MAI 17 (OH)	X:	+0.9129	+0.30872	+157.5269	+1.21837	+0.135526	+0.7054
(2446567.5)				6.078725	5.2353	2.4779	0.3685
A MAI 21 (OH)	Y:	+0.6991	+0.00197	+ 75.7168	+0.27889		+0.3414
				6.137864	5.5957		0.4601
MAI 21 (OH)	X:	+1.8000	-0.01034	+158.8704	+0.75545	+0.095660	+0.7345
(2446571.5)				0.575054	0.3977	4.6695	1.9892
A MAI 25 (OH)	Y:	+0.6803	+0.03432	+ 76.7310	+0.27593		+0.3483
				0.641048	0.0197		2.0892
MAI 25 (OH)	X:	+2.5879	-0.42442	+160.1500	+0.95803	+0.207179	+0.7519
(2446575.5)				1.358372	1.8265	6.1290	3.6272
A MAI 29 (OH)	Y:	+0.7778	+0.01929	+ 77.6891	+0.27642		+0.3527
				1.426872	0.8994		3.7235

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES					
		DU SATELLITE 2 DE JUPITER: EUROPE					
		N=1.7693					
		A0	A1	B0 FO	B1 F1	B2 F2	C0 PO
MAI 29 (OH) (2446579.5)	X:	+0.0394	+0.92225	+164.2607 2.137688	+1.51500 5.6404	+0.418864 2.7115	+0.8060 5.3079
A JUN. 2 (OH)	Y:	+0.9080	-0.02042	+ 78.6599 2.215241	+0.32915 1.6498		+0.3641 5.3692
JUN. 1 (OH) (2446582.5)	X:	+3.1213	-0.58553	+163.1373 1.160486	+1.26077 1.8685	+0.277418 5.9968	+0.7804 3.3408
A JUN. 5 (OH)	Y:	+0.8619	+0.02493	+ 79.4854 1.233396	+0.27225 0.7726		+0.3647 3.4448
JUN. 5 (OH) (2446586.5)	X:	+0.2389	+0.89094	+167.8566 1.943705	+1.51248 5.5677	+0.406979 2.6191	+0.8270 5.0345
A JUN. 9 (OH)	Y:	+1.0004	-0.01963	+ 80.4761 2.022795	+0.32749 1.5432		+0.3753 5.0952
JUN. 9 (OH) (2446590.5)	X:	+2.7942	-0.27499	+168.2630 2.740624	+1.26346 2.0449	+0.139298 5.4162	+0.7873 0.3933
A JUN.13 (OH)	Y:	+0.9882	+0.00761	+ 81.5638 2.810147	+0.29587 2.4780		+0.3764 0.4396
JUN.13 (OH) (2446594.5)	X:	+2.5212	-0.16265	+170.3888 3.526156	+1.04808 2.9459	+0.109821 0.0263	+0.8019 2.0359
A JUN.17 (OH)	Y:	+0.9805	+0.03528	+ 82.6121 3.599339	+0.31367 3.3571		+0.3856 2.0897
JUN.17 (OH) (2446598.5)	X:	+1.7480	+0.31824	+172.0619 4.311086	+0.80831 4.7595	+0.130204 2.9970	+0.7892 3.6512
A JUN.21 (OH)	Y:	+1.0700	+0.01424	+ 83.7739 4.389384	+0.29577 4.1825		+0.3903 3.7125
JUN.21 (OH) (2446602.5)	X:	+3.5227	-0.56404	+175.8460 5.098641	+0.78080 2.8323	+0.261278 6.0186	+0.7876 5.2625
A JUN.25 (OH)	Y:	+1.1190	+0.01495	+ 84.9118 5.180086	+0.29628 5.0128		+0.3979 5.3641
JUN.25 (OH) (2446606.5)	X:	+0.7629	+0.86591	+176.6250 5.901404	+2.32296 5.4713	+0.389230 2.7748	+0.8491 0.5561
A JUN.29 (OH)	Y:	+1.1994	-0.01357	+ 86.0595 5.971306	+0.28093 5.9228		+0.4061 0.6949
JUN.29 (OH) (2446610.5)	X:	+3.5151	-0.43546	+178.7281 0.394867	+1.10204 1.4404	+0.217470 5.5723	+0.8857 2.2492
A JUL. 3 (OH)	Y:	+1.1717	+0.02254	+ 87.2587 0.480838	+0.27372 0.3831		+0.4173 2.3518
JUL. 1 (OH) (2446612.5)	X:	+1.3740	+0.61109	+179.5676 3.932886	+1.31874 4.9277	+0.256292 2.7870	+0.8277 3.1088
A JUL. 5 (OH)	Y:	+1.2084	+0.01104	+ 87.7834 4.018755	+0.29578 4.0079		+0.4156 3.1674
JUL. 5 (OH) (2446616.5)	X:	+3.7811	-0.56382	+184.0675 4.728056	+0.82248 2.7034	+0.261427 5.8830	+0.8470 4.7072
A JUL. 9 (OH)	Y:	+1.2337	+0.01829	+ 88.9374 4.812225	+0.30170 4.8506		+0.4241 4.8186
JUL. 9 (OH) (2446620.5)	X:	+1.3811	+0.61634	+184.5330 5.528874	+1.92270 5.3286	+0.293377 2.5613	+0.9081 0.0264
A JUL.13 (OH)	Y:	+1.3341	-0.02359	+ 90.1203 5.605968	+0.27654 5.8076		+0.4355 0.1535
JUL.13 (OH) (2446624.5)	X:	+2.6724	+0.08193	+187.3538 0.033452	+0.91048 0.2761	+0.093753 3.9750	+0.9211 1.6995
A JUL.17 (OH)	Y:	+1.3005	+0.00722	+ 91.2759 0.118431	+0.27822 0.2856		+0.4423 1.8124

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES					
		DU SATELLITE 2 DE JUPITER: EUROPE					N=1.7693
		AO	A1	BO FO	B1 F1	B2 F2	CO PO
JUL.17 (OH) (2446628.5)	X:	+4.4131	-0.89164	+188.6921 0.822350	+1.93067 2.1822	+0.428526 6.1329	+0.9843 3.3241
A JUL.21 (OH)	Y:	+1.2726	+0.03246	+ 92.4484 0.914809	+0.24880 1.0590		+0.4511 3.4399
JUL.21 (OH) (2446632.5)	X:	+1.0826	+0.84317	+193.8833 1.622718	+1.25002 5.5293	+0.387027 2.7173	+0.9909 5.0294
A JUL.25 (OH)	Y:	+1.3992	-0.02318	+ 93.4495 1.711627	+0.29977 1.9393		+0.4600 5.0957
JUL.25 (OH) (2446636.5)	X:	+4.2018	-0.64680	+193.7236 2.428732	+1.94529 2.1373	+0.300397 5.5082	+0.9687 0.4206
A JUL.29 (OH)	Y:	+1.3428	+0.00515	+ 94.5158 2.508556	+0.29196 2.8569		+0.4624 0.4616
JUL.29 (OH) (2446640.5)	X:	+2.3139	+0.21607	+196.2371 3.216413	+0.85171 4.2127	+0.093522 2.2318	+0.9512 2.0135
A ADU. 2 (OH)	Y:	+1.3446	+0.01518	+ 95.5530 3.306590	+0.28880 3.7951		+0.4697 2.0914
ADU. 1 (OH) (2446643.5)	X:	+3.7109	-0.38742	+197.5911 2.251974	+1.41409 2.0306	+0.201006 5.1982	+0.9957 0.1426
A ADU. 5 (OH)	Y:	+1.3800	-0.00733	+ 96.2769 2.335348	+0.28034 2.7907		+0.4746 0.1920
ADU. 5 (OH) (2446647.5)	X:	+2.8386	-0.04938	+199.8656 3.046192	+0.80455 3.5439	+0.059184 0.5249	+0.9876 1.7552
A ADU. 9 (OH)	Y:	+1.3457	+0.01807	+ 97.2049 3.134364	+0.28353 3.7830		+0.4821 1.8291
ADU. 9 (OH) (2446651.5)	X:	+1.8938	+0.46753	+201.2623 3.842597	+1.28043 5.1159	+0.191578 2.9035	+0.9833 3.4128
A ADU.13 (OH)	Y:	+1.3549	+0.01469	+ 98.0624 3.934495	+0.27484 4.6660		+0.4870 3.4851
ADU.13 (OH) (2446655.5)	X:	+4.1844	-0.74524	+205.0191 4.646959	+0.86349 2.5039	+0.322652 6.1218	+0.9892 4.9872
A ADU.17 (OH)	Y:	+1.4104	-0.01299	+ 98.8797 4.735383	+0.25008 5.6267		+0.4924 5.1162
ADU.17 (OH) (2446659.5)	X:	+0.9451	+0.89444	+203.9448 5.454870	+2.23884 5.5802	+0.416080 2.7321	+1.0541 0.3428
A ADU.21 (OH)	Y:	+1.4300	-0.03196	+ 99.5417 5.536092	+0.26196 0.3260		+0.5009 0.4798
ADU.21 (OH) (2446663.5)	X:	+4.4458	-0.80526	+206.1247 6.241394	+2.14234 1.8052	+0.388054 5.5877	+1.1084 2.0238
A ADU.25 (OH)	Y:	+1.2900	+0.02811	+100.1790 0.056233	+0.18474 1.1429		+0.5100 2.1295
ADU.25 (OH) (2446667.5)	X:	+2.7574	-0.11432	+207.8327 0.768138	+0.64625 2.6521	+0.121700 0.7645	+1.0876 3.6859
A ADU.29 (OH)	Y:	+1.3444	-0.00311	+100.5539 0.857715	+0.22869 2.0455		+0.5094 3.7738
ADU.29 (OH) (2446671.5)	X:	+0.7201	+0.97678	+210.5564 1.572189	+1.63925 5.4109	+0.477564 2.8756	+1.1293 5.3593
A SEP. 2 (OH)	Y:	+1.4098	-0.05210	+100.8121 1.660921	+0.21695 2.7455		+0.5176 5.4210
SEP. 1 (OH) (2446674.5)	X:	+3.3044	-0.43013	+208.9030 0.600466	+1.27508 2.4323	+0.216467 0.0908	+1.1052 3.4147
A SEP. 5 (OH)	Y:	+1.2895	+0.00329	+101.0811 0.691413	+0.21807 2.1589		+0.5144 3.5094

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES					
		DU SATELLITE 2 DE JUPITER: EUROPE					N=1.7693
		AO	A1	BO FO	B1 F1	B2 F2	CO PO
SEP. 5 (OH) (2446678.5)	X:	+0.1574	+1.17778	+212.1337 1.408269	+2.13530 5.3125	+0.564295 2.7769	+1.1468 5.1075
A SEP. 9 (OH)	Y:	+1.3739	-0.05747	+101.0866 1.494906	+0.20366 2.8269		+0.5217 5.1635
SEP. 9 (OH) (2446682.5)	X:	+4.1188	-0.81700	+208.7527 2.216838	+1.78853 2.4319	+0.367713 5.7674	+1.0647 0.4790
A SEP.13 (OH)	Y:	+1.2012	+0.01604	+101.1508 2.296416	+0.25085 4.0149		+0.5136 0.5201
SEP.13 (OH) (2446686.5)	X:	+1.5615	+0.35030	+209.7428 3.009873	+1.28599 4.8597	+0.151466 2.3139	+1.0505 2.0992
A SEP.17 (OH)	Y:	+1.1635	+0.01509	+100.9816 3.099059	+0.25248 4.9101		+0.5151 2.1705
SEP.17 (OH) (2446690.5)	X:	+2.8803	-0.27177	+210.2806 3.819178	+0.24534 0.8526	+0.118629 5.6471	+1.0619 3.6969
A SEP.21 (OH)	Y:	+1.1842	-0.00554	+100.7443 3.902120	+0.24454 5.9003		+0.5116 3.7971
SEP.21 (OH) (2446694.5)	X:	+2.7445	-0.33166	+209.8349 4.621258	+0.37270 1.6275	+0.145317 0.1556	+1.0567 5.3514
A SEP.25 (OH)	Y:	+1.1619	-0.02384	+100.3655 4.704062	+0.26157 0.5929		+0.5122 5.4585
SEP.25 (OH) (2446698.5)	X:	+0.3770	+0.91020	+207.2771 5.429478	+1.79045 5.8684	+0.447373 2.9845	+1.1068 0.6702
A SEP.29 (OH)	Y:	+1.1395	-0.03964	+ 99.8588 5.506274	+0.26786 1.5613		+0.5106 0.8027
SEP.29 (OH) (2446702.5)	X:	+3.9073	-0.95343	+207.4931 6.216641	+2.49536 2.1812	+0.429762 5.8259	+1.1318 2.3662
A OCT. 3 (OH)	Y:	+0.9799	+0.01802	+ 99.2290 0.025113	+0.24679 2.5240		+0.5135 2.4553
OCT. 1 (OH) (2446704.5)	X:	+1.3773	+0.30424	+206.8961 3.482804	+1.15382 5.6110	+0.141768 2.9242	+1.0400 3.1925
A OCT. 5 (OH)	Y:	+1.0313	-0.01145	+ 98.8439 3.566752	+0.26477 5.9940		+0.5040 3.2658
OCT. 5 (OH) (2446708.5)	X:	+3.1356	-0.69172	+207.0725 4.289221	+1.17079 1.9173	+0.288849 6.0404	+1.0297 4.8086
A OCT. 9 (OH)	Y:	+0.9727	-0.01716	+ 98.0678 4.367105	+0.27643 0.6203		+0.4998 4.9207
OCT. 9 (OH) (2446712.5)	X:	-0.2640	+0.98719	+202.5332 5.093198	+1.89435 5.6660	+0.482136 2.7950	+1.0951 0.1394
A OCT.13 (OH)	Y:	+0.9875	-0.05537	+ 97.2438 5.166961	+0.30690 1.5568		+0.4995 0.2611
OCT.13 (OH) (2446716.5)	X:	+2.8162	-0.58038	+202.8819 5.882022	+1.83013 2.0587	+0.271193 5.5823	+1.0881 1.8367
A OCT.17 (OH)	Y:	+0.7975	+0.01065	+ 96.2720 5.966949	+0.27110 2.5036		+0.4967 1.9192
OCT.17 (OH) (2446720.5)	X:	+1.7214	-0.22840	+201.1529 0.403534	+1.15045 3.2878	+0.169022 0.6047	+1.0783 3.4809
A OCT.21 (OH)	Y:	+0.7888	-0.01138	+ 95.2498 0.482195	+0.26818 3.3988		+0.4890 3.5508
OCT.21 (OH) (2446724.5)	X:	+0.1182	+0.63234	+200.0858 1.205566	+1.43346 5.1694	+0.305062 2.9330	+1.0572 5.1435
A OCT.25 (OH)	Y:	+0.7584	-0.02759	+ 94.1516 1.279422	+0.25791 4.1528		+0.4857 5.1900

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES					
		DU SATELLITE 2 DE JUPITER: EUROPE					N=1.7693
		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
OCT.25 (OH)	X:	+3.0193	-0.90383	+195.2914 2.006461	+1.35857 2.2834	+0.394827 5.7581	+1.0064 0.5323
(2446728.5)							
A OCT.29 (OH)	Y:	+0.6246	+0.00069	+ 93.1116 2.075395	+0.28907 5.0036		+0.4752 0.5553
OCT.29 (OH)	X:	-0.0828	+0.54714	+194.8003 2.791148	+1.71855 5.3925	+0.249580 2.5707	+0.9591 2.1006
(2446732.5)							
A NOV. 2 (OH)	Y:	+0.6116	-0.01306	+ 92.0093 2.871827	+0.28576 5.9174		+0.4689 2.1694
NOV. 1 (OH)	X:	+2.6197	-0.80474	+191.4245 1.827967	+1.14909 2.1998	+0.350442 5.6595	+0.9810 0.2495
(2446735.5)							
A NOV. 5 (OH)	Y:	+0.5274	-0.00699	+ 91.1574 1.896838	+0.28671 4.9776		+0.4644 0.2726
NOV. 5 (OH)	X:	+0.0515	+0.34979	+190.8211 2.614070	+1.34765 5.3515	+0.167143 2.4086	+0.9453 1.8201
(2446739.5)							
A NOV. 9 (OH)	Y:	+0.4895	-0.01024	+ 90.0255 2.691435	+0.28474 5.8524		+0.4584 1.8879
NOV. 9 (OH)	X:	+0.5983	+0.04575	+188.3653 3.411652	+0.80102 0.2254	+0.050044 3.5109	+0.9440 3.4642
(2446743.5)							
A NOV.13 (OH)	Y:	+0.4235	-0.01883	+ 88.9112 3.484548	+0.29327 0.4417		+0.4513 3.5363
NOV.13 (OH)	X:	+1.1009	-0.33596	+186.2687 4.207438	+0.81295 1.9115	+0.132998 0.2315	+0.9431 5.0572
(2446747.5)							
A NOV.17 (OH)	Y:	+0.4121	-0.04189	+ 87.8227 4.277261	+0.30950 1.3294		+0.4470 5.1569
NOV.17 (OH)	X:	-0.8191	+0.61007	+182.2896 4.999782	+0.70109 5.7519	+0.289461 2.8744	+0.9541 0.4037
(2446751.5)							
A NOV.21 (OH)	Y:	+0.2925	-0.02259	+ 86.6730 5.068412	+0.29378 2.1503		+0.4393 0.5068
NOV.21 (OH)	X:	+2.2502	-0.99004	+181.7529 5.778315	+2.53717 2.3606	+0.444478 5.7999	+0.9866 2.0790
(2446755.5)							
A NOV.25 (OH)	Y:	+0.1514	+0.01683	+ 85.5998 5.860562	+0.30306 3.2098		+0.4390 2.1439
NOV.25 (OH)	X:	-0.5177	+0.25792	+179.1105 0.298582	+1.12674 4.4071	+0.146711 2.1987	+0.9213 3.7260
(2446759.5)							
A NOV.29 (OH)	Y:	+0.1550	-0.01565	+ 84.4777 0.365808	+0.27094 3.8885		+0.4266 3.7738
NOV.29 (OH)	X:	-0.6272	+0.33190	+176.7660 1.087164	+1.20844 5.3220	+0.199106 3.1655	+0.9144 5.3677
(2446763.5)							
A DEC. 3 (OH)	Y:	+0.1287	-0.04086	+ 83.4159 1.154961	+0.25810 4.7970		+0.4235 5.4061
DEC. 1 (OH)	X:	-1.2061	+0.52716	+173.9300 4.620641	+0.57936 5.6721	+0.253822 2.6934	+0.9070 6.1162
(2446765.5)							
A DEC. 5 (OH)	Y:	+0.0663	-0.02691	+ 82.9849 4.690223	+0.29315 1.9804		+0.4186 6.2107
DEC. 5 (OH)	X:	+0.7295	-0.43686	+173.3151 5.403311	+1.52212 2.2308	+0.213129 5.4173	+0.9082 1.4927
(2446769.5)							
A DEC. 9 (OH)	Y:	-0.0557	+0.00304	+ 81.9779 5.479268	+0.29587 2.9886		+0.4133 1.5633
DEC. 9 (OH)	X:	+0.0530	-0.26549	+170.6747 6.192656	+1.09014 3.2536	+0.135320 0.1802	+0.8796 3.1214
(2446773.5)							
A DEC.13 (OH)	Y:	-0.1027	-0.00267	+ 81.0110 6.265357	+0.27955 3.7381		+0.4055 3.1843

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES					
		DU SATELLITE 2 DE JUPITER: EUROPE					N=1.7693
		A0	A1	B0 FO	B1 F1	B2 F2	C0 PO
DEC.13 (OH) (2446777.5)	X:	-2.0015	+0.74869	+169.4156 0.704728	+2.08837 5.1740	+0.367222 2.7892	+0.8775 4.7962
A DEC.17 (OH)	Y:	-0.0824	-0.04713	+ 80.0265 0.768372	+0.25063 4.6221		+0.4026 4.8252
DEC.17 (OH) (2446781.5)	X:	+0.6338	-0.62227	+164.8498 1.483585	+0.63277 2.2343	+0.272689 5.8050	+0.8047 0.1249
A DEC.21 (OH)	Y:	-0.2350	+0.00127	+ 79.2264 1.553479	+0.27664 5.3353		+0.3922 0.1565
DEC.21 (OH) (2446785.5)	X:	-1.3176	+0.23902	+164.4141 2.263895	+1.09184 5.5776	+0.122086 2.3440	+0.7894 1.7217
A DEC.25 (OH)	Y:	-0.2804	-0.01136	+ 78.3796 2.338456	+0.27692 6.1995		+0.3871 1.7881
DEC.25 (OH) (2446789.5)	X:	-0.4966	-0.16421	+162.1896 3.053497	+0.83113 1.0110	+0.067866 5.4041	+0.7920 3.3099
A DEC.29 (OH)	Y:	-0.3211	-0.01248	+ 77.5662 3.123065	+0.27567 0.7539		+0.3813 3.3960
DEC.29 (OH) (2446793.5)	X:	-0.4569	-0.30067	+160.4722 3.836846	+1.02816 1.9142	+0.123702 6.1862	+0.7754 4.9401
A DEC.33 (OH)	Y:	-0.3914	-0.01420	+ 76.8014 3.906593	+0.27975 1.5820		+0.3759 5.0347

ÉPHÉMÉRIDES DES SATELLITES NATURELS

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES					
		DU SATELLITE 3 DE JUPITER: GANYMEDE					
		N=0.8782					
		A0	A1	B0 FO	B1 F1	B2 F2	C0 PO
JAN. 1 (OH)	X:	+0.9049	-0.05853	+240.3537	+0.98432	+0.017031	+0.2524
(2446431.5)				0.013649	4.1106	5.8689	2.0301
A JAN. 9 (OH)	Y:	+0.2060	+0.00820	+ 86.9570	+0.32671		+0.0889
				0.012228	5.0398		2.0261
JAN. 9 (OH)	X:	+0.4679	+0.03383	+236.9479	+1.14368	+0.012207	+0.2479
(2446439.5)				0.726747	5.0179	2.0340	3.5987
A JAN. 17 (OH)	Y:	+0.2316	+0.00148	+ 87.8332	+0.34579		+0.0913
				0.726726	5.7945		3.5671
JAN. 17 (OH)	X:	+0.6735	-0.02427	+233.5915	+0.96524	+0.004939	+0.2331
(2446447.5)				1.436473	5.8096	0.0587	5.0694
A JAN. 25 (OH)	Y:	+0.2057	+0.00463	+ 88.8692	+0.35606		+0.0907
				1.440028	0.2498		5.0815
JAN. 25 (OH)	X:	+0.5511	-0.00787	+231.1507	+1.00355	+0.001270	+0.2165
(2446455.5)				2.146166	0.2963	2.4795	0.2465
A FEV. 2 (OH)	Y:	+0.2094	-0.00058	+ 90.0087	+0.37491		+0.0861
				2.153006	0.9930		0.2495
FEV. 1 (OH)	X:	+0.6976	-0.04850	+229.2108	+0.92060	+0.012012	+0.2061
(2446462.5)				1.981423	0.2609	0.0718	6.1889
A FEV. 9 (OH)	Y:	+0.1891	+0.00606	+ 91.1186	+0.38635		+0.0868
				1.990934	0.8417		6.1998
FEV. 9 (OH)	X:	+0.5108	+0.00718	+227.8385	+0.95687	+0.003894	+0.2221
(2446470.5)				2.689403	0.9479	2.1994	1.2827
A FEV. 17 (OH)	Y:	+0.2277	+0.00025	+ 92.4588	+0.40024		+0.0930
				2.702921	1.5880		1.2847
FEV. 17 (OH)	X:	+0.7651	-0.04144	+227.0054	+1.09289	+0.011963	+0.2493
(2446478.5)				3.398910	1.7437	5.1039	2.7146
A FEV. 25 (OH)	Y:	+0.2345	+0.00060	+ 93.9148	+0.41414		+0.1037
				3.414823	2.3278		2.7624
FEV. 25 (OH)	X:	+0.7503	-0.05962	+226.5265	+1.06874	+0.013328	+0.2662
(2446486.5)				4.107086	2.5495	0.0678	4.2175
A MAR. 5 (OH)	Y:	+0.2459	-0.00269	+ 95.4927	+0.42010		+0.1100
				4.126634	3.0642		4.2641
MAR. 1 (OH)	X:	+0.2355	+0.05866	+226.7512	+1.07755	+0.020708	+0.2753
(2446490.5)				1.319029	5.9089	2.2836	5.0356
A MAR. 9 (OH)	Y:	+0.2491	-0.00720	+ 96.3042	+0.42955		+0.1129
				1.341206	0.2935		5.0732
MAR. 9 (OH)	X:	+0.4935	-0.00118	+226.7591	+1.00992	+0.007924	+0.2617
(2446498.5)				2.028163	0.5669	4.1550	0.3018
A MAR. 17 (OH)	Y:	+0.1930	+0.00084	+ 98.0575	+0.42859		+0.1107
				2.053212	1.0274		0.3045
MAR. 17 (OH)	X:	+0.3389	+0.00226	+227.6245	+0.88100	+0.008330	+0.2244
(2446506.5)				2.736527	1.3218	1.8155	1.7572
A MAR. 25 (OH)	Y:	+0.1938	-0.00542	+ 99.9098	+0.44186		+0.1023
				2.766235	1.7649		1.7550
MAR. 25 (OH)	X:	+0.1833	+0.06662	+229.1266	+0.86807	+0.020518	+0.2164
(2446514.5)				3.446102	1.9801	3.4657	3.1045
A AVR. 2 (OH)	Y:	+0.1789	-0.00082	+101.8665	+0.45069		+0.1038
				3.479790	2.5094		3.1583

1986

COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 3 DE JUPITER: GANYMEDE

N=0.8782

		AO	A1	BO FO	B1 F1	B2 F2	CO PO
AVR. 1 (OH) (2446521.5)	X:	+0.3866	+0.01729	+230.8471 3.283190	+0.94181 1.9424	+0.010906 3.8238	+0.2350 2.7405
A AVR. 9 (OH)	Y:	+0.1902	-0.00060	+103.6703 3.319178	+0.45099 2.3932		+0.1089 2.8097
AVR. 9 (OH) (2446529.5)	X:	+0.3477	+0.01008	+233.0996 3.995108	+0.95699 2.8705	+0.004631 1.3621	+0.2746 4.2414
A AVR. 17 (OH)	Y:	+0.1802	+0.00337	+105.8549 4.034361	+0.45596 3.1580		+0.1219 4.2860
AVR. 17 (OH) (2446537.5)	X:	+0.4832	-0.02211	+236.3145 4.707868	+0.92997 3.5574	+0.005615 5.0775	+0.2768 5.7698
A AVR. 25 (OH)	Y:	+0.1943	-0.00420	+108.2139 4.750918	+0.45690 3.9092		+0.1277 5.7985
AVR. 25 (OH) (2446545.5)	X:	-0.0291	+0.07700	+239.5662 5.423659	+1.07797 4.5125	+0.016488 2.4870	+0.2682 0.9788
A MAI 3 (OH)	Y:	+0.1523	-0.00201	+110.6771 5.468722	+0.45839 4.6862		+0.1277 1.0532
MAI 1 (OH) (2446551.5)	X:	+0.4806	-0.03680	+243.0778 4.388205	+0.88998 3.2591	+0.019684 4.7825	+0.2563 5.3438
A MAI 9 (OH)	Y:	+0.1163	+0.00066	+112.6194 4.437702	+0.46635 3.6929		+0.1232 5.3217
MAI 9 (OH) (2446559.5)	X:	-0.0135	+0.04800	+247.1363 5.106952	+1.08002 4.2882	+0.012108 1.7252	+0.2383 0.4067
A MAI 17 (OH)	Y:	+0.0871	+0.00622	+115.9552 5.158423	+0.46681 4.4878		+0.1168 0.4943
MAI 17 (OH) (2446567.5)	X:	+0.2441	+0.02476	+252.2571 5.825327	+0.95059 5.1284	+0.008319 4.0398	+0.2554 1.7560
A MAI 25 (OH)	Y:	+0.1280	+0.00359	+118.2653 5.881088	+0.46352 5.2811		+0.1181 1.8489
MAI 25 (OH) (2446575.5)	X:	+0.4701	-0.04640	+257.9444 0.263615	+0.84958 5.8598	+0.014393 0.1516	+0.2764 3.2384
A JUN. 2 (OH)	Y:	+0.1339	+0.00412	+121.3394 0.323256	+0.46357 6.0689		+0.1256 3.2957
JUN. 1 (OH) (2446582.5)	X:	+0.4933	-0.05901	+263.3115 0.111877	+0.83488 5.7338	+0.020069 0.4453	+0.3087 3.0015
A JUN. 9 (OH)	Y:	+0.1562	+0.00034	+124.1259 0.174157	+0.46518 6.0065		+0.1386 3.0295
JUN. 9 (OH) (2446590.5)	X:	-0.1675	+0.10548	+270.0642 0.840724	+1.09435 0.1198	+0.030860 2.7061	+0.3111 4.5799
A JUN. 17 (OH)	Y:	+0.2013	-0.01912	+127.4124 0.904105	+0.47631 0.5580		+0.1427 4.6051
JUN. 17 (OH) (2446598.5)	X:	+0.1399	+0.00656	+276.6362 1.569308	+0.92450 1.1517	+0.009372 2.4981	+0.3022 6.0464
A JUN. 25 (OH)	Y:	+0.1478	-0.01599	+130.9002 1.636834	+0.47274 1.3906		+0.1419 6.1279
JUN. 25 (OH) (2446606.5)	X:	+0.2711	-0.02449	+283.7122 2.302969	+1.02072 2.0087	+0.009493 4.5690	+0.2825 1.2768
A JUL. 3 (OH)	Y:	+0.0744	-0.00438	+134.4940 2.372299	+0.46302 2.2387		+0.1289 1.3624

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES					
		DU SATELLITE 3 DE JUPITER: GANYMEDE					
		N=0.8782					
		A0	A1	B0 FO	B1 F1	B2 F2	C0 PO
JUL. 1 (OH)	X:	+0.4059	-0.05999	+289.0789	+0.98535	+0.011426	+0.2603
(2446612.5)				1.283560	1.2527	6.2166	5.4505
A JUL. 9 (OH)	Y:	+0.0945	-0.00351	+137.2110	+0.46030		+0.1262
				1.355454	1.3105		5.5374
JUL. 9 (OH)	X:	+0.3185	-0.00388	+296.7815	+0.97911	+0.013584	+0.2889
(2446620.5)				2.023429	1.9274	4.0511	0.5742
A JUL. 17 (OH)	Y:	+0.1324	-0.00708	+140.8229	+0.45751		+0.1294
				2.096723	2.1827		0.6408
JUL. 17 (OH)	X:	+0.2010	+0.02346	+304.2487	+0.89345	+0.010321	+0.3110
(2446628.5)				2.765781	2.8742	4.0806	2.0431
A JUL. 25 (OH)	Y:	+0.0751	+0.00954	+144.3586	+0.45022		+0.1465
				2.841152	3.0826		2.1547
JUL. 25 (OH)	X:	+0.7840	-0.11007	+311.7581	+0.89985	+0.036655	+0.3331
(2446636.5)				3.513790	3.4984	5.5833	3.5161
A ADU. 2 (OH)	Y:	+0.0331	+0.02549	+147.7111	+0.44964		+0.1596
				3.588924	4.0126		3.6563
ADU. 1 (OH)	X:	+0.2686	+0.00189	+317.5029	+0.82622	+0.015815	+0.3283
(2446643.5)				3.383124	3.7899	5.0236	3.3842
A ADU. 9 (OH)	Y:	+0.0051	+0.02424	+150.4784	+0.43244		+0.1592
				3.460416	4.0487		3.4953
ADU. 9 (OH)	X:	-0.1353	+0.07754	+323.1864	+1.04087	+0.016502	+0.3336
(2446651.5)				4.135947	4.8251	1.9316	4.9409
A ADU. 17 (OH)	Y:	+0.0772	+0.00798	+153.3033	+0.39607		+0.1513
				4.214585	4.9846		5.0545
ADU. 17 (OH)	X:	+0.2051	+0.01446	+328.7416	+0.86307	+0.001858	+0.3000
(2446659.5)				4.891923	5.7977	1.2730	0.1687
A ADU. 25 (OH)	Y:	+0.1166	+0.00009	+155.5451	+0.38234		+0.1427
				4.970627	5.9845		0.2559
ADU. 25 (OH)	X:	-0.0076	+0.07000	+332.6713	+0.82162	+0.031623	+0.2694
(2446667.5)				5.651570	0.1916	2.1695	1.5022
A SEP. 2 (OH)	Y:	+0.2727	-0.03035	+157.1186	+0.38993		+0.1382
				5.728172	0.7527		1.5756
SEP. 1 (OH)	X:	+0.0726	+0.06336	+335.0424	+0.80423	+0.030884	+0.2807
(2446674.5)				5.531253	0.2953	2.2684	1.1889
A SEP. 9 (OH)	Y:	+0.3051	-0.03408	+157.9278	+0.38700		+0.1415
				5.607475	0.8848		1.2928
SEP. 9 (OH)	X:	+0.7009	-0.06192	+336.3782	+0.95165	+0.013040	+0.3305
(2446682.5)				0.007343	1.5759	4.6129	2.6940
A SEP. 17 (OH)	Y:	+0.2449	-0.02034	+158.0397	+0.37861		+0.1570
				0.084916	1.8917		2.8218
SEP. 17 (OH)	X:	-0.3912	+0.17269	+336.9312	+0.45789	+0.045892	+0.3456
(2446690.5)				0.770967	3.0014	2.7197	4.3635
A SEP. 25 (OH)	Y:	+0.1961	-0.01626	+157.3318	+0.37889		+0.1568
				0.845202	2.9041		4.3773
SEP. 25 (OH)	X:	+0.7017	-0.07401	+333.8883	+0.78664	+0.037165	+0.2899
(2446698.5)				1.530528	3.2401	5.1711	5.9269
A OCT. 3 (OH)	Y:	+0.0081	+0.02779	+155.9712	+0.42501		+0.1365
				1.603644	3.9410		5.8938

1986

COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 3 DE JUPITER: GANYMEDE

N=0.8782

		AO	A1	BO FO	B1 F1	B2 F2	CO PO
DCT. 1 (OH) (2446704.5)	X:	-0.2776	+0.14042	+332.2853 0.530159	+0.55578 3.0216	+0.036813 2.9687	+0.2627 3.9280
A OCT. 9 (OH)	Y:	+0.1391	-0.00964	+154.3130 0.601408	+0.41426 3.0659		+0.1264 3.9352
DCT. 9 (OH) (2446712.5)	X:	+0.8778	-0.10832	+326.8535 1.286027	+0.80623 3.2921	+0.048728 5.3216	+0.2058 5.3124
A OCT. 17 (OH)	Y:	-0.0227	+0.03832	+151.8561 1.356535	+0.45831 4.0548		+0.1079 5.2792
DCT. 17 (OH) (2446720.5)	X:	+0.1598	+0.05454	+322.1164 2.039140	+1.04232 4.6747	+0.017735 1.1477	+0.2192 0.1939
A OCT. 25 (OH)	Y:	+0.1155	+0.02172	+148.7259 2.109045	+0.45503 4.9513		+0.1101 0.3221
DCT. 25 (OH) (2446728.5)	X:	+0.7913	-0.05157	+315.5473 2.792397	+0.79742 5.8572	+0.018107 5.4816	+0.2691 1.6719
A NOV. 2 (OH)	Y:	+0.2116	+0.00570	+145.3482 2.858572	+0.44692 5.8735		+0.1184 1.7493
NOV. 1 (OH) (2446735.5)	X:	+0.7135	-0.03372	+309.2784 2.660464	+0.86811 5.7812	+0.011302 5.7432	+0.2715 1.4370
A NOV. 9 (OH)	Y:	+0.2398	+0.00182	+142.2938 2.725667	+0.45027 5.8616		+0.1226 1.4945
NOV. 9 (OH) (2446743.5)	X:	+0.1479	+0.05900	+301.4724 3.402437	+0.94203 0.0642	+0.030381 1.9145	+0.2444 3.0939
A NOV. 17 (OH)	Y:	+0.2921	-0.01982	+138.8077 3.468145	+0.45824 0.4834		+0.1093 3.0494
NOV. 17 (OH) (2446751.5)	X:	+0.1041	+0.10525	+293.8409 4.142423	+1.06201 0.9475	+0.038022 3.2587	+0.2035 4.5691
A NOV. 25 (OH)	Y:	+0.2696	-0.02210	+135.3214 4.206823	+0.45858 1.3525		+0.0993 4.4994
NOV. 25 (OH) (2446759.5)	X:	+0.6769	-0.07065	+286.5685 4.879470	+1.13391 2.1232	+0.013386 6.1316	+0.1782 5.7741
A DEC. 3 (OH)	Y:	+0.1756	-0.00074	+131.8973 4.941823	+0.43746 2.2082		+0.0857 5.8393
DEC. 1 (OH) (2446765.5)	X:	+0.4941	+0.02788	+280.8472 3.857952	+1.19395 1.0700	+0.024091 3.9372	+0.1710 3.5839
A DEC. 9 (OH)	Y:	+0.2354	-0.00639	+129.5273 3.920303	+0.44482 1.2940		+0.0924 3.6742
DEC. 9 (OH) (2446773.5)	X:	+0.9498	-0.10978	+273.6447 4.588283	+1.21405 2.0736	+0.023456 6.2134	+0.2080 4.9020
A DEC. 17 (OH)	Y:	+0.2394	-0.00022	+126.4808 4.649394	+0.43254 2.1222		+0.0989 5.0259
DEC. 17 (OH) (2446781.5)	X:	+0.4396	+0.04909	+266.1114 5.314306	+0.92993 2.7795	+0.014931 3.5509	+0.2505 0.2144
A DEC. 25 (OH)	Y:	+0.2547	+0.00165	+123.7021 5.375689	+0.43232 2.9514		+0.1104 0.2633
DEC. 25 (OH) (2446789.5)	X:	+0.8776	-0.08001	+259.8272 6.036601	+1.11250 3.4807	+0.020560 5.9795	+0.2459 1.7714
A DEC. 33 (OH)	Y:	+0.2270	+0.00736	+121.1680 6.099761	+0.44165 3.7873		+0.1116 1.7982

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES				
		DU SATELLITE 4 DE JUPITER: CALLISTO				
		N=0.3765				
		AO	A1	B0 FO	B1 F1	CO FO
JAN. 1 (OH) (2446431.5)	X:	- 0.8747	- 0.13277	+423.3220 5.867913	+ 1.83660 3.7203	+1.0366 4.8621
A JAN. 9 (OH)	Y:	- 0.1296	- 0.08759	+153.6717 5.871538	+ 0.52565 4.4595	+0.3852 4.8336
JAN. 9 (OH) (2446439.5)	X:	+10.8168	- 3.18057	+400.7529 2.580517	+ 1.18433 2.3656	+1.5136 4.0968
A JAN.17 (OH)	Y:	+ 3.9988	- 1.19900	+148.9559 2.587908	+ 0.91150 2.5533	+0.5731 4.0818
JAN.17 (OH) (2446447.5)	X:	-12.3165	+ 2.42246	+398.5726 5.556570	+ 1.05673 4.9233	+1.1350 4.8180
A JAN.25 (OH)	Y:	- 4.5785	+ 0.90733	+151.9732 5.566970	+ 0.79115 5.3178	+0.4394 4.8009
JAN.25 (OH) (2446455.5)	X:	- 2.8350	+ 0.63838	+409.2001 2.248108	+ 2.35081 0.4605	+0.8170 3.9744
A FEV. 2 (OH)	Y:	- 1.1512	+ 0.23800	+159.5886 2.261504	+ 0.86630 0.9747	+0.3225 3.9479
FEV. 1 (OH) (2446462.5)	X:	- 1.1950	+ 0.12950	+403.4970 4.848092	+ 1.68088 2.9624	+1.1022 2.8686
A FEV. 9 (OH)	Y:	- 0.4743	+ 0.06508	+160.5236 4.864109	+ 0.59593 3.6342	+0.4460 2.8694
FEV. 9 (OH) (2446470.5)	X:	- 1.3881	+ 0.19036	+400.7713 1.547412	+ 1.81424 6.2052	+1.1411 2.6584
A FEV.17 (OH)	Y:	- 0.5112	+ 0.04314	+162.7419 1.566701	+ 0.74591 0.4982	+0.4733 2.6579
FEV.17 (OH) (2446478.5)	X:	+12.1721	- 3.35597	+409.9640 4.555596	+ 4.16363 3.0912	+1.6877 2.7985
A FEV.25 (OH)	Y:	+ 4.9019	- 1.35573	+169.9677 4.577461	+ 1.72494 3.3174	+0.7043 2.8016
FEV.25 (OH) (2446486.5)	X:	-10.5676	+ 2.07658	+405.6223 1.238966	+ 3.26533 6.0016	+0.6673 1.7298
A MAR. 5 (OH)	Y:	- 4.5332	+ 0.87535	+171.3247 1.265426	+ 1.38356 6.2779	+0.2858 1.7285
MAR. 1 (OH) (2446490.5)	X:	- 6.1642	+ 1.25812	+403.8280 2.698232	+ 2.20266 0.7577	+1.2425 5.3302
A MAR. 9 (OH)	Y:	- 2.6874	+ 0.51791	+171.8094 2.726400	+ 0.77673 1.1632	+0.5294 5.3358
MAR. 9 (OH) (2446498.5)	X:	- 5.7297	+ 1.46778	+391.7859 5.687026	+ 1.21727 4.9210	+0.9606 5.2289
A MAR.17 (OH)	Y:	- 2.4035	+ 0.61454	+169.6142 5.719373	+ 0.75250 5.2989	+0.4246 5.2337
MAR.17 (OH) (2446506.5)	X:	+11.5188	- 2.86327	+385.5879 2.386158	+ 1.86009 2.2857	+1.3690 4.0271
A MAR.25 (OH)	Y:	+ 5.1387	- 1.31719	+169.0079 2.423093	+ 1.14695 2.4283	+0.6079 4.0337
MAR.25 (OH) (2446514.5)	X:	- 3.2055	+ 0.45674	+400.2269 5.362291	+ 1.74383 4.2799	+1.2141 4.4424
A AVR. 2 (OH)	Y:	- 1.6820	+ 0.25476	+177.7355 5.401733	+ 0.86914 4.6659	+0.5480 4.4892

1986

COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 4 DE JUPITER: CALLISTO

N=0.3765

		A0	A1	B0 FO	B1 F1	C0 FO
AVR. 1 (OH) (2446521.5)	X:	+ 0.1280	- 0.23126	+405.5302 1.680392	+ 1.46517 0.3594	+1.1619 3.3765
A AVR. 9 (OH)	Y:	- 0.2083	- 0.06937	+182.3161 1.723179	+ 0.70359 0.7523	+0.5149 3.4096
AVR. 9 (OH) (2446529.5)	X:	- 5.2098	+ 1.07020	+405.2767 4.656563	+ 1.08561 3.9028	+0.7958 3.0871
A AVR. 17 (OH)	Y:	- 2.4883	+ 0.49837	+183.8418 4.702648	+ 0.62603 4.2954	+0.3687 3.1348
AVR. 17 (OH) (2446537.5)	X:	-10.1862	+ 2.75598	+423.4850 1.390071	+ 3.76013 0.2104	+0.7439 2.0715
A AVR. 25 (OH)	Y:	- 4.6310	+ 1.22746	+193.9932 1.437872	+ 1.70183 0.3570	+0.3346 2.1332
AVR. 25 (OH) (2446545.5)	X:	+11.9362	- 2.80106	+429.9658 4.375445	+ 3.77408 3.2197	+1.6247 2.6601
A MAI 3 (OH)	Y:	+ 5.5340	- 1.33640	+198.7406 4.428185	+ 1.76315 3.3456	+0.7700 2.7036
MAI 1 (OH) (2446551.5)	X:	- 5.6105	+ 1.64591	+423.3889 0.318967	+ 2.64970 5.9942	+1.4702 0.6310
A MAI 9 (OH)	Y:	- 2.6372	+ 0.75205	+196.3994 0.374430	+ 1.30792 6.1490	+0.6832 0.6745
MAI 9 (OH) (2446559.5)	X:	+ 6.5059	- 1.42684	+431.7269 3.304123	+ 2.60567 2.6929	+0.8570 0.4375
A MAI 17 (OH)	Y:	+ 3.1323	- 0.74206	+201.1975 3.364876	+ 1.32683 2.8597	+0.3897 0.5274
MAI 17 (OH) (2446567.5)	X:	+ 5.9931	- 1.48442	+449.3054 6.265406	+ 1.39519 4.7782	+0.7501 0.0803
A MAI 25 (OH)	Y:	+ 2.3964	- 0.63139	+209.9865 0.044888	+ 0.56683 5.1036	+0.3665 0.1530
MAI 25 (OH) (2446575.5)	X:	- 3.5578	+ 0.71266	+455.8262 2.975999	+ 1.07723 2.1528	+1.4923 5.9561
A JUN. 2 (OH)	Y:	- 1.9896	+ 0.36251	+214.1309 3.040415	+ 0.48554 2.4580	+0.7052 6.0170
JUN. 1 (OH) (2446582.5)	X:	- 5.2186	+ 1.05832	+457.5261 5.611505	+ 2.44506 5.2982	+1.4920 5.2710
A JUN. 9 (OH)	Y:	- 2.7646	+ 0.53980	+215.3778 5.680270	+ 1.21526 5.4539	+0.7113 5.3372
JUN. 9 (OH) (2446590.5)	X:	- 8.3020	+ 2.55794	+487.0630 2.318126	+ 2.49261 0.9739	+1.1902 5.3357
A JUN. 17 (OH)	Y:	- 4.0152	+ 1.17967	+229.7584 2.387257	+ 1.05301 1.0823	+0.5737 5.3907
JUN. 17 (OH) (2446598.5)	X:	+ 7.0545	- 1.52853	+494.4843 5.316972	+ 1.84553 4.3074	+1.2406 4.2797
A JUN. 25 (OH)	Y:	+ 3.6024	- 0.84255	+234.3816 5.389459	+ 0.82439 4.3507	+0.5944 4.3097
JUN. 25 (OH) (2446606.5)	X:	+ 8.6764	- 1.75388	+489.9548 2.031865	+ 2.44588 2.3651	+1.4986 4.0183
A JUL. 3 (OH)	Y:	+ 3.6227	- 0.78638	+232.1242 2.109252	+ 1.19818 2.4546	+0.6965 4.1001

ÉPHÉMÉRIDES DES SATELLITES NATURELS

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES				
		DU SATELLITE 4 DE JUPITER: CALLISTO				
		N=0.3765				
		AO	A1	BO FO	B1 F1	CO FO
JUL. 1 (OH) (2446612.5)	X:	+ 4.2274	- 0.60850	+511.5770 4.294540	+ 1.84072 3.8397	+1.5528 2.4711
A JUL. 9 (OH)	Y:	+ 2.3530	- 0.43774	+242.7665 4.374780	+ 0.91989 3.9040	+0.7640 2.5707
JUL. 9 (OH) (2446620.5)	X:	+12.9629	- 2.82501	+517.0137 0.987619	+ 1.86486 2.2947	+1.7590 2.6564
A JUL. 17 (OH)	Y:	+ 5.6459	- 1.28734	+244.6137 1.069542	+ 0.96758 2.3123	+0.8308 2.7089
JUL. 17 (OH) (2446628.5)	X:	+ 1.4044	- 0.57347	+533.3807 4.031044	+ 2.27430 4.1438	+1.1494 2.1932
A JUL. 25 (OH)	Y:	+ 0.1970	- 0.21946	+252.8044 4.112126	+ 1.04796 4.2819	+0.5530 2.2695
JUL. 25 (OH) (2446636.5)	X:	-11.5156	+ 3.30159	+548.8216 0.789070	+ 3.59684 0.4857	+1.3164 1.2441
A AOU. 2 (OH)	Y:	- 5.7371	+ 1.57917	+260.6302 0.872366	+ 1.64978 0.5388	+0.6062 1.3002
AOU. 1 (OH) (2446643.5)	X:	-10.9607	+ 2.88830	+564.3758 3.375659	+ 1.43221 5.5087	+1.9656 0.5517
A AOU. 9 (OH)	Y:	- 5.8687	+ 1.46894	+266.9326 3.457385	+ 0.82711 5.6105	+0.9396 0.6125
AOU. 9 (OH) (2446651.5)	X:	+ 5.3163	- 0.64714	+569.4388 0.131185	+ 1.61348 1.2422	+1.1454 0.7379
A AOU. 17 (OH)	Y:	+ 3.2314	- 0.54079	+269.7203 0.211986	+ 0.76371 1.6102	+0.5176 0.8862
AOU. 17 (OH) (2446659.5)	X:	+11.0286	- 2.73337	+569.2525 3.182182	+ 3.26794 3.6201	+0.7254 0.3537
A AOU. 25 (OH)	Y:	+ 4.3707	- 1.18421	+269.5762 3.266606	+ 1.38852 3.7130	+0.3625 0.4784
AOU. 25 (OH) (2446667.5)	X:	+ 2.6085	- 0.66299	+588.1862 6.190005	+ 0.97322 1.2735	+1.2250 6.0274
A SEP. 2 (OH)	Y:	+ 0.9305	- 0.29025	+277.1562 6.274709	+ 0.46504 1.5562	+0.5765 6.1276
SEP. 1 (OH) (2446674.5)	X:	+ 6.5442	- 2.07052	+579.5311 2.559294	+ 3.06336 3.7440	+1.4679 4.9603
A SEP. 9 (OH)	Y:	+ 2.3566	- 0.88850	+273.0667 2.644471	+ 1.31328 3.8825	+0.6706 5.0579
SEP. 9 (OH) (2446682.5)	X:	-16.8080	+ 4.53693	+568.9878 5.595878	+ 4.52888 0.3425	+1.8566 5.6410
A SEP. 17 (OH)	Y:	- 8.2287	+ 2.17318	+266.8539 5.682521	+ 2.02907 0.4100	+0.9026 5.7119
SEP. 17 (OH) (2446690.5)	X:	+ 5.8769	- 1.28340	+584.6723 2.339363	+ 1.99597 3.7504	+1.0304 4.5568
A SEP. 25 (OH)	Y:	+ 3.1443	- 0.77833	+272.4604 2.423174	+ 0.94137 3.8478	+0.4754 4.5519
SEP. 25 (OH) (2446698.5)	X:	+ 9.4030	- 2.07817	+598.9947 5.366647	+ 1.74478 2.2228	+1.6077 4.1919
A OCT. 3 (OH)	Y:	+ 3.9595	- 0.94401	+278.8131 5.446267	+ 0.96068 2.3255	+0.7336 4.2789

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES				
		DU SATELLITE 4 DE JUPITER: CALLISTO				
		N=0.3765				
		AO	A1	BO FO	B1 F1	CO FO
OCT. 1 (OH) (2446704.5)	X:	- 3.1977	+ 1.00208	+586.3642 1.362940	+ 0.73556 3.9000	+1.0600 2.4230
A OCT. 9 (OH)	Y:	- 1.3095	+ 0.34779	+272.0778 1.440494	+ 0.48582 4.1587	+0.5045 2.5456
OCT. 9 (OH) (2446712.5)	X:	+13.1017	- 2.81290	+586.0861 4.402369	+ 1.51921 2.2055	+2.0946 2.6943
A OCT. 17 (OH)	Y:	+ 5.8391	- 1.31285	+271.6458 4.478965	+ 0.87169 2.1858	+0.9670 2.7539
OCT. 17 (OH) (2446720.5)	X:	+ 6.4575	- 2.13462	+564.8156 1.104898	+ 3.24168 3.7010	+1.3366 2.6685
A OCT. 25 (OH)	Y:	+ 2.2764	- 0.88536	+260.5401 1.182727	+ 1.45791 3.8362	+0.6189 2.7231
OCT. 25 (OH) (2446728.5)	X:	-12.7310	+ 3.32914	+550.7024 4.114134	+ 3.90911 0.3829	+1.2762 1.4805
A NOV. 2 (OH)	Y:	- 6.0936	+ 1.55367	+252.9899 4.188471	+ 1.79482 0.4592	+0.5707 1.5218
NOV. 1 (OH) (2446735.5)	X:	- 8.5309	+ 2.05760	+542.8501 0.519733	+ 0.67914 4.6305	+1.5906 0.7605
A NOV. 9 (OH)	Y:	- 4.6921	+ 1.06701	+249.8822 0.594945	+ 0.42714 4.9544	+0.7382 0.8068
NOV. 9 (OH) (2446743.5)	X:	- 3.5660	+ 1.09217	+533.7392 3.505192	+ 2.60651 0.4102	+1.4586 0.6990
A NOV. 17 (OH)	Y:	- 1.1894	+ 0.36176	+244.9698 3.579029	+ 1.09537 0.5488	+0.6497 0.7797
NOV. 17 (OH) (2446751.5)	X:	+11.3566	- 2.58761	+522.5215 0.215502	+ 3.64572 3.3144	+0.8126 1.0056
A NOV. 25 (OH)	Y:	+ 4.8509	- 1.17537	+239.8131 0.285290	+ 1.60797 3.3777	+0.3872 1.0974
NOV. 25 (OH) (2446759.5)	X:	+ 5.8447	- 1.82820	+497.5003 3.258525	+ 0.40099 0.6445	+0.7990 6.0708
A DEC. 3 (OH)	Y:	+ 2.3943	- 0.80419	+229.3258 3.327702	+ 0.19534 1.1540	+0.3708 6.1647
DEC. 1 (OH) (2446765.5)	X:	+ 7.1930	- 1.44774	+501.5172 5.493373	+ 2.93617 2.8327	+1.1034 4.4672
A DEC. 9 (OH)	Y:	+ 3.0784	- 0.67445	+231.1912 5.561129	+ 1.29156 2.9244	+0.5014 4.5357
DEC. 9 (OH) (2446773.5)	X:	+ 5.9642	- 1.65838	+472.6375 2.211743	+ 1.07522 5.1604	+1.4819 4.2056
A DEC. 17 (OH)	Y:	+ 2.5705	- 0.76259	+218.5488 2.281062	+ 0.36534 5.2228	+0.6812 4.2627
DEC. 17 (OH) (2446781.5)	X:	- 7.2132	+ 1.70393	+459.4989 5.208809	+ 0.74814 2.0990	+1.1388 4.6307
A DEC. 25 (OH)	Y:	- 3.9984	+ 0.90759	+212.6302 5.277879	+ 0.17813 1.8592	+0.5346 4.7381
DEC. 25 (OH) (2446789.5)	X:	- 5.5397	+ 1.62531	+464.2363 1.928453	+ 2.89616 6.0856	+0.7045 4.0603
A DEC. 33 (OH)	Y:	- 2.3325	+ 0.66429	+215.8729 1.995483	+ 1.22612 6.1923	+0.3424 4.1010

PHÉNOMÈNES DES SATELLITES GALILÉENS

DESCRIPTION :

Les satellites Galiléens, dont les orbites sont faiblement inclinées sur l'équateur et sur l'écliptique, présentent de nombreux phénomènes. Au cours de chaque révolution, les trois premiers satellites, et en général le quatrième satellite, traversent le cône de visibilité et le cône d'ombre qui s'appuient sur la planète. On peut alors observer les passages des satellites devant Jupiter et les occultations par Jupiter lors de la traversée du cône de visibilité, ou les éclipses ou les passages d'ombre sur la planète lors de la traversée du cône d'ombre. Au cours d'une année, environ 3 000 tels événements (passages début ou fin, éclipses début ou fin, occultations début ou fin, passages d'ombres début ou fin) sont calculables (mais environ 2 200 seulement sont observables). Nous donnons ici une représentation compacte de ces prédictions utilisant un développement polynomial.

MÉTHODE DE CALCUL :

Les tables des pages 44 et 45 permettent de calculer les dates en TDT des phénomènes des satellites Galiléens de la manière suivante.

Soit P la période synodique moyenne d'un satellite ; la date approchée T_1 du phénomène proche de la date T est donnée par la relation :

$$T_1 = K \times P + \tau/24 + T_0 \quad (2)$$

où K représente la partie entière de la quantité $(T - T_0)/P$ et où τ est donné, sur l'intervalle $T_0, T_0 + DT$ par un polynôme de la forme :

$$\tau = C_0 + C_1 x + C_2 x^2 + \dots + C_n x^n \quad (3)$$

avec $x = \{2(T - T_0)/DT\} - 1 \quad (4)$

T_1 ayant été obtenu par la relation (2), on peut répéter le calcul en substituant T_1 à T dans la formule (4) pour obtenir une date T_2 plus proche du phénomène recherché que T_1 . La précision de ce type de prédiction est meilleure que 60 secondes de temps.

Les tables donnent les coefficients C_i de la formule (3), numérotés de C_0 à C_{14} pour les quatre satellites et pour les phénomènes :

- débuts et fins des éclipses des satellites par Jupiter (notées respectivement EC.D et EC.F),
- débuts et fins des occultations des satellites par Jupiter (notées OC.D et OC.F),
- débuts et fins des passages de l'ombre des satellites sur le disque de Jupiter (OM.D et OM.F),
- débuts et fins des passages des satellites devant la planète (PA.D et PA.F).

EXEMPLE D'UTILISATION :

Déterminons les dates des phénomènes du satellite I (Io) au voisinage du 30 juin 1986.

PHENOMENA OF THE GALILEAN SATELLITES

DESCRIPTION :

The Galilean satellites which orbits have low inclinations over the equator and the ecliptic, display many phenomena. During each revolution, the first three satellites and, often the fourth one, pass through the visibility and shadow cones which are tangent to the planet. It is then possible to observe the transits of the satellites across Jupiter and their occultations by Jupiter when they pass through the visibility cone, or the eclipses and the shadow transits when the shadow cone is involved. In the course of a year 3 000 such events may be computed (transits ingress and egress, eclipses disappearance and reappearance, occultations disappearance and reappearance, transits of the shadow ingress and egress). Only about 2 200 are observable. A compact representation of these predictions using a polynomial approximation is given here.

COMPUTATIONAL METHOD :

The tables on p. 44 and 45 permit the computation of the dates in TDT of phenomena of the satellites of Jupiter in the following way.

Let P be the mean synodic period of a satellite ; the approximate date T_1 of a phenomenon close to a date T is given by :

$$T_1 = K \times P + \tau/24 + T_0 \quad (2)$$

where K is the integer part of $(T - T_0)/P$ and where τ is given (on the interval $T_0, T_0 + DT$) by a polynomial :

$$\tau = C_0 + C_1 x + C_2 x^2 + \dots + C_n x^n \quad (3)$$

with $x = \{2(T - T_0)/DT\} - 1 \quad (4)$

The value T_1 deduced from equation (2) is then substituted in place of T in equation (4). The new iteration yields a date T_2 closer to the date of the phenomenon than T_1 . The precision of this type of prediction is better than 60 seconds of time. The tables give the coefficients C_i in formula (3), numbered from C_0 to C_{14} , for the four satellites and for the following phenomena :

- disappearance and reappearance of the satellites eclipsed by Jupiter (denoted respectively by EC.D and EC.F),
- disappearance and reappearance of the satellites occulted by Jupiter (denoted OC.D and OC.F),
- ingress and egress of the transits of the satellites shadow across the disc of Jupiter (OM.D and OM.F),
- ingress and egress of the satellites transits across the planet (PA.D and PA.F).

EXAMPLE :

Let us find the dates of the phenomena of satellite I (Io) which takes place near the 30th of June 1986.

Voyons tout d'abord le calcul pour le début d'occultation pour lequel les tables donnent :

$$T0 = 0 ; P = 1,769\ 860\ 5 ; DT = 366$$

Du 0 janvier au 30 juin 1986, 181 jours se sont écoulés, on a donc :

$T = 181$ et la formule (4) donne alors :

$$x = \{2(181 - 0)/366\} - 1 = -0,010\ 928\ 962$$

La formule (3) donne ensuite :

$$\begin{aligned} \tau = & 35.396\ 713 - 1.361\ 964\ x - 6.282\ 018\ x^2 - 1.279\ 462\ x^3 \\ & + 5.203\ 862\ x^4 + 9.081\ 125\ x^5 + 4.847\ 314\ x^6 - 12.892\ 598\ x^7 \\ & - 18.666\ 860\ x^8 + 9.401\ 818\ x^9 + 23.054\ 055\ x^{10} - 3.543\ 933\ x^{11} \\ & - 13.817\ 788\ x^{12} + 0.525\ 266\ x^{13} + 3.336\ 400\ x^{14} \end{aligned}$$

d'où : $\tau = 35,410\ 849\ 25$

On a d'autre part :

$$K = \text{partie entière de} \\ \{(181 - 0)/1,769\ 860\ 5\} = 102$$

La formule (2) donne alors :

$TI = 102 \times 1,769\ 860\ 5 + 35,410\ 849\ 25/24 + 0$
 $TI = 182,001\ 223\ 1$ jours depuis le 0 janvier (début de l'intervalle pour les occultations) soit OC.D le 1 juillet 1986 à 0 h 1 min 46 s TDT. Le calcul réitéré donne $T2 = 182,000\ 936\ 0$ jours soit le 1 juillet 1986 à 0 h 1 min 21 s TDT.

On trouverait de même pour les autres phénomènes :

OC.F : le 1 juillet à 2 h 16 min 46 s TDT
 EC.D : le 30 juin à 22 h 40 min 37 s TDT
 EC.F : le 1 juillet à 0 h 57 min 32 s TDT
 PA.D : le 30 juin à 2 h 41 min 9 s TDT
 PA.F : le 30 juin à 4 h 54 min 54 s TDT
 OM.D : le 30 juin à 1 h 22 min 1 s TDT
 OM.F : le 30 juin à 3 h 37 min 0 s TDT

IMPORTANT : Conditions d'existence des phénomènes

Le recouvrement des cônes d'ombre et de visibilité, rend inexistants certains phénomènes. Ainsi, avant (ou après) l'opposition de Jupiter, les fins (respectivement débuts) d'éclipses et les débuts (respectivement fins) d'occultations sont inobservables. Ceci ne pouvant être pris en compte dans la représentation, il est nécessaire que l'utilisateur vérifie les conditions d'existence pour les éclipses et les occultations en calculant les quatre phases EC.D, EC.F, OC.D et OC.F. Ainsi, dans l'exemple précédent, on a dans l'ordre chronologique :

EC.D : le 30 juin à 22 h 40 min 37 s observable
 OC.D : le 1 juillet à 0 h 1 min 21 s inobservable car déjà éclipsé
 EC.F : le 1 juillet à 0 h 57 min 32 s inobservable car encore occulté
 OC.F : le 1 juillet à 2 h 16 min 46 s observable

D'autre part, les caractéristiques de l'orbite du satellite IV (Callisto) font qu'il n'existe pas toujours de phénomènes. Les coefficients relatifs à ce satellite ne sont donc donnés que sur l'intervalle où ils existent.

Let us start with the computation of the disappearance for the occultation of the satellite for which the tables give :

$$T0 = 0 ; P = 1.769\ 860\ 5 ; DT = 366$$

Between January 0 to June the 30th 1986, 181 days have elapsed

T = 181 and formula (4) gives :

$$x = \{2(181 - 0)/366\} - 1 = -0.010\ 928\ 962$$

Formula (3) then gives :

therefore $\tau = 35.410\ 849\ 25$

On the other hand,

$$K = \text{integer part of} \\ \{(181 - 0)/1.769\ 860\ 5\} = 102$$

Formula (2) then gives :

TI = 102 × 1.769 860 5 + 35.410 849 25/24 + 0
 $TI = 182.001\ 223\ 1$ days from January 0 (beginning of the interval for the occultations) that is July the 1st 1986 at 0 h 1 min 46 s TDT. Another iteration gives $T2 = 182.000\ 936\ 0$ days that is July the 1st 1986 at 0 h 1 min 21 s TDT.

One would find as well for the other phenomena :

OC.F : July the 1st at 2 h 16 min 46 s TDT
 EC.D : June the 30th at 22 h 40 min 37 s TDT
 EC.F : July the 1st at 0 h 57 min 32 s TDT
 PA.D : June the 30th at 2 h 41 min 9 s TDT
 PA.F : June the 30th at 4 h 54 min 54 s TDT
 OM.D : June the 30th at 1 h 22 min 1 s TDT
 OM.F : June the 30th at 3 h 37 min 0 s TDT

IMPORTANT : Conditions for the existence of the phenomena

As the visibility and shadow cones may sometimes overlap, some of the computed phenomena may not exist. Thus, before (or after) the opposition of Jupiter, the reappearances (respectively the disappearances) for the eclipses, and the disappearances (respectively reappearances) for the occultations are not observable. This could not be taken into account in the representation ; so the user will have to check the existence conditions of the eclipses and occultations by computing the four steps EC.D, EC.F, OC.D and OC.F. For instance, in the example above one has, in chronological order :

EC.D : June the 30th at 22 h 40 min 37 s observable
OC.D : July the 1st at 0 h 1 min 21 s unobservable as already eclipsed
EC.F : July the 1st at 0 h 57 min 32 s unobservable as yet occulted
OC.F : July the 1st at 2 h 16 min 46 s observable

Moreover, the orbit of satellite IV (Callisto) is such that phenomena are not always present. The coefficients for this satellite are given on the interval for which they exist.

AN 1986 SATELLITE 1 P = 1.7698605 JOURS TO = 0.0 DT = 366.JOURS

EC.D		EC.F		OM.D		OM.F	
0	34.057629	0	36.339447	0	12.745132	0	14.995173
1	-0.144565	1	-0.195350	1	-0.322982	1	-0.289245
2	0.025451	2	0.009481	2	0.153558	2	0.351634
3	0.512084	3	0.518852	3	0.806964	3	0.645988
4	0.087965	4	0.101398	4	1.082719	4	0.300253
5	-0.351193	5	-0.193662	5	0.068151	5	-0.262250
6	0.486589	6	0.315812	6	-3.433694	6	-2.033380
7	0.218516	7	-0.315555	7	-2.678051	7	-0.993666
8	-2.213200	8	-1.549928	8	5.493061	8	4.208079
9	-0.169352	9	0.671187	9	5.167196	9	2.652303
10	3.436823	10	2.317936	10	-5.058469	10	-4.540997
11	0.093549	11	-0.548433	11	-4.214479	11	-2.501162
12	-2.430584	12	-1.551493	12	2.467546	12	2.475203
13	-0.020170	13	0.170667	13	1.288402	13	0.834480
14	0.658732	14	0.395180	14	-0.488528	14	-0.536548

OC.D		OC.F		PA.D		PA.F	
0	35.396713	0	37.654089	0	14.053027	0	16.282905
1	-1.361964	1	-1.441659	1	-1.435694	1	-1.432865
2	-6.282018	2	-6.200884	2	-5.924464	2	-5.673580
3	-1.279462	3	-1.100194	3	-1.558391	3	-1.576193
4	5.203862	4	5.223460	4	4.713610	4	4.078263
5	9.081125	5	8.870991	5	10.398407	5	9.956433
6	4.847314	6	4.252725	6	6.952984	6	7.743817
7	-12.892598	7	-12.929974	7	-15.309694	7	-13.920198
8	-18.666860	8	-17.077384	8	-24.285534	8	-24.619348
9	9.401818	9	9.804532	9	11.920847	9	10.144026
10	23.054055	10	20.922354	10	30.600597	10	30.336304
11	-3.543933	11	-3.957592	11	-5.014422	11	-3.920486
12	-13.817788	12	-12.355469	12	-18.850812	12	-18.512670
13	0.525266	13	0.663208	13	0.902200	13	0.633532
14	3.336400	14	2.933028	14	4.668040	14	4.563763

TO = 0 CORRESPOND AU 0 JANVIER 1986 à 0 H SOIT LA DATE JULIENNE 2446430.5

AN 1986 SATELLITE 2 P = 3.5540942 JOURS TO = 0.0 DT = 366.JOURS

EC.D		EC.F		OM.D		OM.F	
0	45.106975	0	47.925655	0	2.961084	0	5.766636
1	-0.303603	1	-0.353632	1	0.203452	1	0.078142
2	1.078939	2	1.084006	2	-0.849966	2	-0.688771
3	1.045707	3	0.947363	3	0.802464	3	0.842626
4	-0.615443	4	-0.950572	4	2.168465	4	1.151950
5	-1.320807	5	-1.028240	5	-2.349127	5	-3.872821
6	0.622886	6	2.578726	6	-5.415594	6	-2.654836
7	2.754209	7	1.671468	7	5.175687	7	10.835440
8	-1.530519	8	-7.253244	8	8.567161	8	3.291878
9	-4.068663	9	-1.980586	9	-7.178730	9	-15.930747
10	2.253503	10	10.949048	10	-7.288362	10	-0.778083
11	3.099177	11	1.204806	11	5.211355	11	11.593345
12	-1.706278	12	-8.284008	12	2.953591	12	-1.444802
13	-0.934235	13	-0.287854	13	-1.493452	13	-3.296734
14	0.516000	14	2.470505	14	-0.407606	14	0.804938

OC.D		OC.F		PA.D		PA.F	
0	47.789227	0	50.526159	0	5.649919	0	8.364771
1	-2.529034	1	-2.693443	1	-2.238682	1	-2.462528
2	-11.643847	2	-11.356868	2	-13.336337	2	-12.798420
3	-3.742098	3	-3.101647	3	-2.763016	3	-2.264495
4	9.309795	4	9.444813	4	10.750494	4	9.902086
5	19.297052	5	17.815884	5	15.989128	5	14.572639
6	10.640311	6	9.105660	6	11.471677	6	11.344477
7	-23.987426	7	-21.923309	7	-17.602070	7	-14.774972
8	-36.072058	8	-33.060122	8	-44.299671	8	-42.288228
9	13.808413	9	11.955287	9	4.824986	9	1.584657
10	42.061460	10	38.976896	10	57.605760	10	54.985585
11	-2.687288	11	-1.733229	11	4.027025	11	6.025959
12	-24.095073	12	-22.426135	12	-36.475102	12	-35.081661
13	-0.349824	13	-0.558592	13	-2.280809	13	-2.800493
14	5.612299	14	5.238435	14	9.254336	14	8.996802

TO = 0 CORRESPOND AU 0 JANVIER 1986 à 0 H SOIT LA DATE JULIENNE 2446430.5

AN 1986 SATELLITE 3 P = 7.1663872 JOURS TO = 0.0 DT = 366.JOURS

EC.D		EC.F		OM.D		OM.F	
0	25.506423	0	28.992138	0	111.606078	0	115.045245
1	0.390770	1	0.132324	1	0.282016	1	0.093699
2	0.065818	2	-0.006933	2	0.250695	2	0.453012
3	0.664780	3	0.707199	3	0.196190	3	-0.049478
4	1.798363	4	1.679599	4	-1.116851	4	-2.187018
5	-1.418345	5	-1.711748	5	5.723509	5	5.482294
6	-9.136867	6	-8.622113	6	8.787818	6	10.328885
7	4.480143	7	5.566373	7	-23.180714	7	-21.428893
8	20.401784	8	19.123909	8	-22.841694	8	-23.133053
9	-8.250592	9	-10.122502	9	39.803671	9	37.200832
10	-20.784477	10	-19.037267	10	25.738047	10	24.093406
11	7.097986	11	8.604823	11	-31.778136	11	-30.071503
12	8.218032	12	7.015099	12	-12.109697	12	-10.370491
13	-2.261933	13	-2.720727	13	9.639713	13	9.204067
14	-0.393188	14	-0.068512	14	1.537159	14	0.991673

OC.D		OC.F		PA.D		PA.F	
0	30.973943	0	34.251023	0	117.031337	0	120.264409
1	-4.323978	1	-4.908171	1	-4.335988	1	-4.859095
2	-25.650781	2	-25.019268	2	-25.172430	2	-24.329373
3	-7.860940	3	-6.102325	3	-8.537392	3	-7.077022
4	21.955934	4	22.620314	4	17.874706	4	18.009694
5	39.877998	5	36.737778	5	44.781492	5	42.040212
6	11.610179	6	6.605700	6	32.478299	6	27.135874
7	-54.371755	7	-51.198051	7	-70.095060	7	-67.605212
8	-53.060226	8	-43.522978	8	-99.666469	8	-86.679926
9	37.997721	9	36.191149	9	63.685631	9	63.374220
10	67.083288	10	57.677039	10	114.048022	10	98.717378
11	-13.016172	11	-12.514663	11	-33.444145	11	-34.445092
12	-43.434072	12	-38.570135	12	-61.840790	12	-52.640397
13	1.503937	13	1.462486	13	7.744064	13	8.221978
14	11.945201	14	10.900665	14	12.861407	14	10.625973

TO = 0 CORRESPOND AU 0 JANVIER 1986 à 0 H SOIT LA DATE JULIENNE 2446430.5

AN 1986 SATELLITE 4 P = 16.7535520 JOURS TO = 0.0 DT = 366.JOURS

EC.D		EC.F		OM.D		OM.F	
0	57.294317	0	61.144735	0	258.313548	0	262.116985
1	1.485465	1	0.102636	1	1.982081	1	0.590013
2	0.628511	2	0.032762	2	0.268334	2	-0.082543
3	0.811220	3	0.705411	3	1.207057	3	0.737361
4	-0.009339	4	-0.048899	4	2.136203	4	1.191586
5	-1.743585	5	-2.154523	5	-2.030455	5	-2.658485
6	0.423831	6	-0.055427	6	-5.757257	6	-6.468785
7	5.038823	7	6.368090	7	3.369430	7	7.341398
8	-1.170337	8	0.315322	8	6.642065	8	14.241464
9	-7.919065	9	-10.378469	9	-3.460697	9	-10.996690
10	0.893159	10	-1.555304	10	0.133131	10	-15.061175
11	5.959006	11	8.071172	11	1.670630	11	8.040454
12	0.144453	12	2.073632	12	-5.905522	12	6.912086
13	-1.689174	13	-2.405899	13	-0.174641	13	-2.302320
14	-0.264187	14	-0.875443	14	3.165919	14	-0.917531

OC.D		OC.F		PA.D		PA.F	
0	70.277801	0	72.848395	0	271.680853	0	274.117402
1	-8.233492	1	-12.586836	1	-7.771302	1	-12.585065
2	-58.866231	2	-57.253213	2	-60.283845	2	-59.317851
3	-25.644401	3	-7.883176	3	-27.452829	3	-7.613609
4	34.256354	4	60.187395	4	29.988912	4	67.654322
5	106.878797	5	67.506715	5	111.557184	5	69.211770
6	102.556654	6	-19.864520	6	130.596089	6	-46.701795
7	-139.105012	7	-94.104569	7	-140.952280	7	-100.072172
8	-284.963739	8	-24.516382	8	-352.946455	8	33.653188
9	89.462022	9	66.996502	9	83.686728	9	77.248568
10	333.777713	10	32.802653	10	421.740019	10	-35.302445
11	-24.520682	11	-24.706926	11	-17.164303	11	-33.205706
12	-195.826502	12	-14.120477	12	-255.133465	12	25.877476
13	0.748695	13	3.576369	13	-1.828793	13	6.250182
14	46.589213	14	1.756785	14	62.874366	14	-7.451129

TO = 0 CORRESPOND AU 0 JANVIER 1986 à 0 H SOIT LA DATE JULIENNE 2446430.5

SATELLITES DE SATURNE
SATELLITES OF SATURN

DONNÉES SUR LES SATELLITES DE SATURNE

DATA ON THE SATELLITES OF SATURN

NOM	masse	rayon	période rotation sidérale	albédo géométrique	magnitude visuelle	période orbitale	élongation maximale	1/2 grand axe	excentricité	inclinaison sur l'équateur de Saturne
unité →	masse de Saturne	km	jour			jour	(°) (")	10 ³ km		degré
I Mimas	8.0×10^{-8}	196	(S)	0.53	12.9	0.942 421	30	185.52	0.020 2	1.53
II Enceladus	1.3×10^{-7}	250	(S)	0.99	11.7	1.370 217	38	238.02	0.004 5	0.
III Tethys	1.3×10^{-6}	530	(S)	0.88	10.2	1.887 802	48	294.66	0.	1.86
IV Dione	1.85×10^{-6}	560	(S)	0.65	10.4	2.736 914	1 01	377.40	0.002 2	0.02
V Rhea	4.4×10^{-6}	765	(S)	0.67	9.7	4.517 500	1 25	527.04	0.001 0	0.35
VI Titan	2.41×10^{-4}	2 575	(S)	0.21	8.28	15.945 420	3 17	1 221.83	0.029 1	0.33
VII Hyperion	$3. \times 10^{-8}$	205 × 130 × 110		0.3	14.19	21.276 608	3 59	1 481.1	0.104	0.43
VIII Iapetus	3.3×10^{-6}	730	(S)	0.5-0.05	11.2	79.330 182	9 35	3 561.3	0.028 2	14.72
IX Phoebe	$7. \times 10^{-10}$	110	0.4	0.06	16.45	(R)550.48	34 51	12 952.	0.163 2	177. (1)
X Janus (5)		110 × 100 × 80	(S)	0.4	14.	0.694 5	24	151.472	0.007	0.14
XI Epimetheus (5)		70 × 60 × 50	(S)	0.4	15.	0.694 2	24	151.422	0.009	0.34
XII 1980S6 (2)		18 × 16 × 15		0.5	17.	2.736 9	1 01	377.40	0.005	0.2
XIII Telesto (3)		17 × 14 × 13		0.6	18.	1.887 8	48	294.66		
XIV Calypso (3)		17 × 11 × 11		0.8	18.5	1.887 8	48	294.66		
XV Atlas		20 × 10		0.4	18.	0.601 9	22	137.670		0.3
XVI 1980S27 (4)		70 × 50 × 40		0.6	15.	0.613 0	23	139.353		0.
XVII 1980S26 (4)		55 × 45 × 35		0.6	15.5	0.628 5	23	141.700	0.004	0.1
NAME	mass	radius	sidereal period	geometrical albedo	visual magnitude	orbital period	greatest elongation	semi major axis	eccentricity	inclination on Saturn's equator
unit →	Saturn's mass	km	day			day	(°) (")	10 ³ km		degree

NOTES

(S) : révolution synchrone

(R) : révolution rétrograde

(1) : inclinaison par rapport à l'écliptique.

Les éphémérides de Phœbé sont données sous la forme de coefficients de Tchébycheff dans le supplément à la Connaissance des Temps « Satellites faibles... »

(2) : « Dioné B » : même orbite que Dioné

(3) : Telesto et Calypso : même orbite que Téthys

(4) : satellites coorbitaux « gardiens » de l'anneau F

(5) : Janus et Epimetheus : même orbite

(S) : *synchronous revolution*(R) : *retrograde revolution*(1) : *inclination on the ecliptic*

The ephemerides of Phœbe are given as Chebychev coefficients in the supplément à la Connaissance des Temps « Faint Satellites... »

(2) : « *Dione B* » : *same orbit as Dione*(3) : *Telesto and Calypso : same orbit as Tethys*(4) : *satellites on the same orbit « shepherding » F ring*(5) : *Janus and Epimetheus : same orbit*

Données extraites de l'*Encyclopédie du Bureau des Longitudes*

Data from the Encyclopédie du Bureau des Longitudes

ÉPHÉMÉRIDES DES HUIT PREMIERS SATELLITES DE SATURNE

EPHEMERIDES OF THE FIRST EIGHT SATELLITES OF SATURN

Coordonnées différentielles tangentielles données en secondes de degré dans le repère équatorial moyen 1950.0 *Differential tangential coordinates given in arcsecond in the mean equatorial frame 1950.0*

$$\begin{aligned}\Delta\alpha \cos\delta &= X \\ \Delta\delta &= Y\end{aligned}$$

$$\left. \begin{matrix} X \\ Y \end{matrix} \right\} = A0 + A1 \cdot t + B0 \sin(Nt + F0) + B1 \cdot t \sin(Nt + F1) + B2 \cdot t^2 \sin(Nt + F2) + C0 \sin(2Nt + P0)$$

où $t = T - T0$ avec $T0$ date du début de l'intervalle et T date du calcul *where $t = T - T0$ with $T0$ date of the beginning of the interval and T the date for the calculation*

satellite	intervalle Δt (jours)	N (rad/j)	page
Mimas	2	6.667 0	50
Encelade	16	4.586 0	65
Téthys	16	3.328 0	67
Dioné	16	2.296 0	69
Rhée	16	1.391 0	71
Titan	11	0.394 0	73
Hypériorion	8	0.394 0	76
Japet	16	0.079 0	80
	(days)	(rad/d)	

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES					
		DU SATELLITE 1 DE SATURNE :				MIMAS	N=6.667
		A0	A1	B0 FO	B1 F1	B2 F2	C0 PO
JAN. 1 (OH) (2446431.5)	X:	+0.5270	-0.00721	+23.7298 1.640194	+0.03890 0.6783	+0.000234 1.4657	+0.2383 4.0894
A JAN. 3 (OH)	Y:	-0.2320	-0.00342	+ 9.8696 3.351608	+0.01538 1.9289	+0.002047 2.7542	+0.0994 5.8003
JAN. 3 (OH) (2446433.5)	X:	+0.5141	-0.00860	+23.7782 2.405078	+0.03955 1.1827	+0.004685 2.8544	+0.2395 5.5859
A JAN. 5 (OH)	Y:	-0.2385	-0.00263	+ 9.8799 4.115718	+0.01962 2.8632	+0.000951 5.7623	+0.0992 1.0153
JAN. 5 (OH) (2446435.5)	X:	+0.4975	-0.00709	+23.8196 3.169839	+0.04336 2.2614	+0.002950 5.8044	+0.2394 0.8017
A JAN. 7 (OH)	Y:	-0.2445	-0.00250	+ 9.8931 4.879875	+0.02059 3.5728	+0.001085 6.0207	+0.0996 2.5104
JAN. 7 (OH) (2446437.5)	X:	+0.4819	-0.00784	+23.8673 3.934806	+0.04199 3.0001	+0.000863 6.0597	+0.2406 2.2989
A JAN. 9 (OH)	Y:	-0.2495	-0.00297	+ 9.9058 5.643798	+0.01891 4.5504	+0.001216 2.9336	+0.0997 4.0096
JAN. 9 (OH) (2446439.5)	X:	+0.4663	-0.00875	+23.9177 4.699745	+0.03727 3.8365	+0.001826 3.3277	+0.2409 3.7990
A JAN. 11 (OH)	Y:	-0.2551	-0.00247	+ 9.9211 0.124733	+0.01867 5.2032	+0.000631 5.9093	+0.1000 5.5068
JAN. 11 (OH) (2446441.5)	X:	+0.4490	-0.00823	+23.9696 5.464915	+0.03972 4.5179	+0.002136 5.9096	+0.2416 5.2986
A JAN. 13 (OH)	Y:	-0.2601	-0.00252	+ 9.9366 0.888900	+0.02031 5.9945	+0.000572 1.5497	+0.1001 0.7224
JAN. 13 (OH) (2446443.5)	X:	+0.4329	-0.00941	+24.0190 6.230113	+0.04601 5.4615	+0.002468 2.3209	+0.2419 0.5142
A JAN. 15 (OH)	Y:	-0.2651	-0.00242	+ 9.9533 1.653013	+0.02049 0.5381	+0.000412 2.8128	+0.1003 2.2218
JAN. 15 (OH) (2446445.5)	X:	+0.4145	-0.00890	+24.0767 0.712161	+0.04009 6.2774	+0.000493 5.5278	+0.2424 2.0152
A JAN. 17 (OH)	Y:	-0.2704	-0.00193	+ 9.9697 2.417058	+0.02066 1.5318	+0.001340 5.7933	+0.1003 3.7183
JAN. 17 (OH) (2446447.5)	X:	+0.3950	-0.00852	+24.1344 1.477377	+0.03671 0.9933	+0.003201 5.8837	+0.2425 3.5116
A JAN. 19 (OH)	Y:	-0.2742	-0.00250	+ 9.9914 3.181286	+0.01734 2.1031	+0.001427 2.6910	+0.1006 5.2179
JAN. 19 (OH) (2446449.5)	X:	+0.3783	-0.01065	+24.1981 2.243137	+0.03640 1.3775	+0.004601 2.7837	+0.2434 5.0127
A JAN. 21 (OH)	Y:	-0.2785	-0.00223	+10.0121 3.945488	+0.01717 2.9636	+0.000706 3.0196	+0.1005 0.4298
JAN. 21 (OH) (2446451.5)	X:	+0.3587	-0.00992	+24.2598 3.008722	+0.03642 2.3300	+0.000742 3.9225	+0.2436 0.2259
A JAN. 23 (OH)	Y:	-0.2834	-0.00150	+10.0336 4.710103	+0.02193 3.6010	+0.002004 5.9294	+0.1010 1.9288
JAN. 23 (OH) (2446453.5)	X:	+0.3377	-0.00924	+24.3195 3.774589	+0.04486 3.1246	+0.003647 5.9489	+0.2449 1.7268
A JAN. 25 (OH)	Y:	-0.2869	-0.00204	+10.0560 5.474386	+0.01977 4.5635	+0.000700 2.7051	+0.1011 3.4254
JAN. 25 (OH) (2446455.5)	X:	+0.3186	-0.01086	+24.3864 4.540364	+0.03666 4.0411	+0.002118 2.9696	+0.2453 3.2257
A JAN. 27 (OH)	Y:	-0.2905	-0.00188	+10.0792 6.238873	+0.02045 5.3512	+0.000415 3.1617	+0.1016 4.9246

1986

COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 1 DE SATURNE: MIMAS

N=6.667

		AO	A1	BO FO	B1 F1	B2 F2	CO PO
JAN.27 (OH) (2446457.5)	X:	+0.2974	-0.01044	+24.4533 5.306396	+0.03745 4.7343	+0.001248 5.3991	+0.2463 4.7270
A JAN.29 (OH)	Y:	-0.2942	-0.00149	+10.1046 0.720227	+0.01915 6.0823	+0.000823 0.2115	+0.1018 0.1402
JAN.29 (OH) (2446459.5)	X:	+0.2766	-0.01084	+24.5200 6.072505	+0.04080 5.5497	+0.001095 1.0443	+0.2470 6.2275
A JAN.31 (OH)	Y:	-0.2972	-0.00169	+10.1303 1.484914	+0.02151 0.5485	+0.001011 2.4830	+0.1020 1.6401
JAN.31 (OH) (2446461.5)	X:	+0.2556	-0.01148	+24.5883 0.555571	+0.04526 0.0688	+0.002388 2.6033	+0.2473 1.4458
A FEV. 2 (OH)	Y:	-0.3008	-0.00114	+10.1561 2.249440	+0.02181 1.5410	+0.000940 5.5791	+0.1023 3.1383
FEV. 2 (OH) (2446463.5)	X:	+0.2317	-0.01026	+24.6617 1.321645	+0.03977 1.1605	+0.003661 5.7793	+0.2482 2.9448
A FEV. 4 (OH)	Y:	-0.3035	-0.00126	+10.1848 3.014214	+0.02118 2.2866	+0.000054 6.2638	+0.1024 4.6386
FEV. 4 (OH) (2446465.5)	X:	+0.2102	-0.01174	+24.7361 2.088219	+0.03888 1.7521	+0.001521 2.7281	+0.2483 4.4465
A FEV. 6 (OH)	Y:	-0.3054	-0.00161	+10.2164 3.778891	+0.01646 3.1233	+0.001833 2.8010	+0.1028 6.1344
FEV. 6 (OH) (2446467.5)	X:	+0.1886	-0.01256	+24.8165 2.854838	+0.03106 2.4845	+0.003923 2.9312	+0.2494 5.9439
A FEV. 8 (OH)	Y:	-0.3085	-0.00068	+10.2463 4.544055	+0.02152 3.7455	+0.001587 5.8406	+0.1029 1.3521
FEV. 8 (OH) (2446469.5)	X:	+0.1634	-0.01089	+24.8876 3.621622	+0.04513 3.2837	+0.004181 5.8507	+0.2500 1.1633
A FEV.10 (OH)	Y:	-0.3106	-0.00075	+10.2789 5.309131	+0.02031 4.5358	+0.000775 6.1850	+0.1034 2.8476
FEV.10 (OH) (2446471.5)	X:	+0.1402	-0.01205	+24.9669 4.388469	+0.04005 4.1422	+0.000182 0.8670	+0.2512 2.6619
A FEV.12 (OH)	Y:	-0.3119	-0.00112	+10.3099 6.074214	+0.02266 5.4842	+0.001337 2.8311	+0.1038 4.3490
FEV.12 (OH) (2446473.5)	X:	+0.1166	-0.01263	+25.0457 5.155374	+0.04056 5.0308	+0.001541 3.2510	+0.2521 4.1649
A FEV.14 (OH)	Y:	-0.3138	-0.00049	+10.3447 0.556282	+0.01979 6.2164	+0.000784 6.1695	+0.1042 5.8472
FEV.14 (OH) (2446475.5)	X:	+0.0915	-0.01201	+25.1268 5.922524	+0.03790 5.7244	+0.002101 6.1843	+0.2530 5.6665
A FEV.16 (OH)	Y:	-0.3149	-0.00057	+10.3793 1.321690	+0.02120 0.6741	+0.000680 1.9246	+0.1046 1.0649
FEV.16 (OH) (2446477.5)	X:	+0.0679	-0.01311	+25.2048 0.406612	+0.04648 0.1924	+0.002902 2.4045	+0.2536 0.8851
A FEV.18 (OH)	Y:	-0.3161	-0.00036	+10.4146 2.087100	+0.02205 1.5231	+0.000355 3.4863	+0.1050 2.5654
FEV.18 (OH) (2446479.5)	X:	+0.0417	-0.01226	+25.2890 1.173808	+0.04392 1.1756	+0.001297 5.4761	+0.2545 2.3879
A FEV.20 (OH)	Y:	-0.3173	+0.00006	+10.4499 2.852623	+0.02467 2.4029	+0.001192 5.7212	+0.1051 4.0648
FEV.20 (OH) (2446481.5)	X:	+0.0156	-0.01224	+25.3715 1.941183	+0.04758 2.0410	+0.002215 5.8093	+0.2546 3.8880
A FEV.22 (OH)	Y:	-0.3169	-0.00048	+10.4902 3.618180	+0.01890 3.2462	+0.001633 2.7205	+0.1056 5.5648

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES					
		DU SATELLITE 1 DE SATURNE: MIMAS				N=6.667	
		AO	A1	BO FO	B1 F1	B2 F2	CO PO
FEV.22 (OH)	X:	-0.0079	-0.01414	+25.4632	+0.03308	+0.004994	+0.2560
(2446483.5)				2.708915	2.7347	2.8245	5.3899
A FEV.24 (OH)	Y:	-0.3172	+0.00005	+10.5286	+0.02107	+0.000157	+0.1057
				4.383995	4.0007	4.7370	0.7805
FEV.24 (OH)	X:	-0.0348	-0.01275	+25.5462	+0.04298	+0.001724	+0.2562
(2446485.5)				3.476631	3.5221	5.5507	0.6073
A FEV.26 (OH)	Y:	-0.3178	+0.00068	+10.5695	+0.02063	+0.002044	+0.1064
				5.150146	4.5680	6.0058	2.2795
FEV.26 (OH)	X:	-0.0619	-0.01243	+25.6315	+0.04429	+0.003371	+0.2579
(2446487.5)				4.244640	4.1938	6.0308	2.1088
A FEV.28 (OH)	Y:	-0.3167	+0.00008	+10.6086	+0.02342	+0.001241	+0.1066
				5.916088	5.5720	2.6483	3.7798
FEV.28 (OH)	X:	-0.0870	-0.01395	+25.7188	+0.04623	+0.002736	+0.2586
(2446489.5)				5.012488	5.2209	2.8612	3.6115
A MAR. 2 (OH)	Y:	-0.3160	+0.00048	+10.6499	+0.02255	+0.000220	+0.1073
				0.399127	0.0470	2.8527	5.2795
MAR. 2 (OH)	X:	-0.1142	-0.01308	+25.8073	+0.04168	+0.001458	+0.2599
(2446491.5)				5.780667	5.9388	5.8462	5.1143
A MAR. 4 (OH)	Y:	-0.3151	+0.00086	+10.6924	+0.02120	+0.000721	+0.1077
				1.165406	0.8719	0.3733	0.4980
MAR. 4 (OH)	X:	-0.1404	-0.01351	+25.8937	+0.04526	+0.001435	+0.2607
(2446493.5)				0.265757	0.3896	1.6836	0.3342
A MAR. 6 (OH)	Y:	-0.3134	+0.00071	+10.7351	+0.02199	+0.001025	+0.1082
				1.931908	1.5712	2.7406	1.9997
MAR. 6 (OH)	X:	-0.1669	-0.01372	+25.9818	+0.04713	+0.001924	+0.2613
(2446495.5)				1.034132	1.1694	2.8262	1.8384
A MAR. 8 (OH)	Y:	-0.3122	+0.00134	+10.7767	+0.02579	+0.001198	+0.1085
				2.698393	2.4728	5.5259	3.4999
MAR. 8 (OH)	X:	-0.1955	-0.01247	+26.0693	+0.05499	+0.003843	+0.2621
(2446497.5)				1.802387	2.1686	5.7195	3.3393
A MAR.10 (OH)	Y:	-0.3098	+0.00112	+10.8221	+0.02314	+0.000296	+0.1089
				3.465058	3.2939	2.5386	5.0027
MAR.10 (OH)	X:	-0.2209	-0.01412	+26.1628	+0.04348	+0.002734	+0.2628
(2446499.5)				2.571125	2.9107	2.7755	4.8440
A MAR.12 (OH)	Y:	-0.3068	+0.00103	+10.8677	+0.02236	+0.001413	+0.1092
				4.231711	4.2425	2.7651	0.2174
MAR.12 (OH)	X:	-0.2472	-0.01407	+26.2552	+0.04308	+0.002383	+0.2636
(2446501.5)				3.339806	3.8078	3.0107	0.0601
A MAR.14 (OH)	Y:	-0.3049	+0.00206	+10.9137	+0.02139	+0.002099	+0.1098
				4.998958	4.7323	5.9491	1.7204
MAR.14 (OH)	X:	-0.2760	-0.01229	+26.3406	+0.04759	+0.005073	+0.2649
(2446503.5)				4.108864	4.3057	5.9547	1.5649
A MAR.16 (OH)	Y:	-0.3015	+0.00179	+10.9598	+0.02216	+0.000356	+0.1102
				5.766018	5.6443	1.0517	3.2184
MAR.16 (OH)	X:	-0.3019	-0.01371	+26.4311	+0.04907	+0.001413	+0.2657
(2446505.5)				4.877762	5.2981	2.4468	3.0659
A MAR.18 (OH)	Y:	-0.2974	+0.00162	+11.0043	+0.02545	+0.001486	+0.1109
				0.250123	0.1329	2.8013	4.7214
MAR.18 (OH)	X:	-0.3285	-0.01361	+26.5190	+0.05037	+0.001235	+0.2671
(2446507.5)				5.646845	6.0899	3.1045	4.5708
A MAR.20 (OH)	Y:	-0.2939	+0.00239	+11.0519	+0.02237	+0.000932	+0.1113
				1.017454	1.0312	6.1603	6.2223

1986

COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 1 DE SATURNE: MIMAS

N=6.667

		AO	A1	BO FO	B1 F1	B2 F2	CO PO
MAR.20 (OH) (2446509.5)	X:	-0.3556	-0.01282	+26.6086 0.132907	+0.04600 0.6131	+0.001816 0.1355	+0.2680 6.0745
A MAR.22 (OH)	Y:	-0.2893	+0.00225	+11.0986 1.785042	+0.02238 1.7275	+0.000739 2.3713	+0.1119 1.4421
MAR.22 (OH) (2446511.5)	X:	-0.3809	-0.01367	+26.6942 0.902317	+0.04864 1.2508	+0.003119 2.5904	+0.2687 1.2957
A MAR.24 (OH)	Y:	-0.2849	+0.00261	+11.1447 2.552663	+0.02446 2.5430	+0.000478 4.5479	+0.1124 2.9445
MAR.24 (OH) (2446513.5)	X:	-0.4086	-0.01231	+26.7810 1.671553	+0.05611 2.2130	+0.002473 5.4900	+0.2697 2.7995
A MAR.26 (OH)	Y:	-0.2800	+0.00296	+11.1910 3.320461	+0.02639 3.3244	+0.001103 5.7951	+0.1126 4.4472
MAR.26 (OH) (2446515.5)	X:	-0.4345	-0.01254	+26.8671 2.441090	+0.05576 2.9889	+0.001237 5.7915	+0.2698 4.3035
A MAR.28 (OH)	Y:	-0.2737	+0.00248	+11.2401 4.088158	+0.02425 4.3520	+0.001745 2.6361	+0.1132 5.9479
MAR.28 (OH) (2446517.5)	X:	-0.4581	-0.01382	+26.9604 3.210707	+0.04709 3.9978	+0.004690 2.7940	+0.2712 5.8052
A MAR.30 (OH)	Y:	-0.2683	+0.00330	+11.2873 4.856341	+0.02355 4.9776	+0.000779 5.9577	+0.1134 1.1678
MAR.30 (OH) (2446519.5)	X:	-0.4850	-0.01167	+27.0412 3.980562	+0.05038 4.5190	+0.003514 5.8955	+0.2716 1.0267
A MAR.32 (OH)	Y:	-0.2625	+0.00374	+11.3366 5.624629	+0.02016 5.7448	+0.001663 6.1363	+0.1141 2.6670
AVR. 1 (OH) (2446521.5)	X:	-0.5102	-0.01170	+27.1261 4.750496	+0.04768 5.3307	+0.002262 0.0368	+0.2731 2.5281
A AVR. 3 (OH)	Y:	-0.2550	+0.00313	+11.3815 0.109748	+0.02611 0.2316	+0.001896 2.7148	+0.1145 4.1711
AVR. 3 (OH) (2446523.5)	X:	-0.5333	-0.01273	+27.2063 5.520317	+0.05711 6.1818	+0.003484 2.8106	+0.2739 4.0338
A AVR. 5 (OH)	Y:	-0.2481	+0.00380	+11.4291 0.878210	+0.02371 1.0931	+0.000140 5.2272	+0.1152 5.6717
AVR. 5 (OH) (2446525.5)	X:	-0.5581	-0.01124	+27.2894 0.007214	+0.04966 0.7551	+0.001728 5.9893	+0.2751 5.5374
A AVR. 7 (OH)	Y:	-0.2407	+0.00409	+11.4759 1.646750	+0.02364 1.9275	+0.000534 0.2925	+0.1157 0.8930
AVR. 7 (OH) (2446527.5)	X:	-0.5807	-0.01160	+27.3671 0.777397	+0.04957 1.4378	+0.001784 2.2027	+0.2759 0.7594
A AVR. 9 (OH)	Y:	-0.2326	+0.00399	+11.5223 2.415501	+0.02248 2.6555	+0.000862 3.0611	+0.1162 2.3963
AVR. 9 (OH) (2446529.5)	X:	-0.6036	-0.01110	+27.4445 1.547558	+0.05200 2.2493	+0.001104 3.5316	+0.2766 2.2650
A AVR. 11 (OH)	Y:	-0.2249	+0.00466	+11.5662 3.184320	+0.02653 3.3930	+0.001511 5.6607	+0.1166 3.8991
AVR. 11 (OH) (2446531.5)	X:	-0.6271	-0.00977	+27.5168 2.317701	+0.06231 3.0413	+0.004031 5.7582	+0.2769 3.7678
A AVR. 13 (OH)	Y:	-0.2156	+0.00431	+11.6131 3.953126	+0.02499 4.3518	+0.000770 2.3093	+0.1171 5.4033
AVR. 13 (OH) (2446533.5)	X:	-0.6464	-0.01129	+27.5978 3.088083	+0.05196 4.0365	+0.003674 2.6613	+0.2780 5.2732
A AVR. 15 (OH)	Y:	-0.2062	+0.00448	+11.6577 4.722068	+0.02636 5.1865	+0.001012 2.5952	+0.1172 0.6211

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES					
		DU SATELLITE 1 DE SATURNE: MIMAS				N=6.667	
		AO	A1	BO FO	B1 F1	B2 F2	CO PO
AVR.15 (OH) (2446535.5)	X:	-0.6672	-0.01011	+27.6695 3.858473	+0.05454 4.7748	+0.000494 2.7734	+0.2780 0.4919
A AVR.17 (OH)	Y:	-0.1977	+0.00547	+11.7043 5.491441	+0.01949 5.8988	+0.002226 6.0127	+0.1179 2.1245
AVR.17 (OH) (2446537.5)	X:	-0.6888	-0.00833	+27.7387 4.629209	+0.04484 5.4043	+0.004930 6.0921	+0.2796 1.9965
A AVR.19 (OH)	Y:	-0.1874	+0.00494	+11.7467 6.260652	+0.02385 0.3978	+0.000947 2.4924	+0.1181 3.6261
AVR.19 (OH) (2446539.5)	X:	-0.7064	-0.00970	+27.8050 5.399629	+0.05628 6.2772	+0.003223 2.6262	+0.2799 3.5000
A AVR.21 (OH)	Y:	-0.1768	+0.00500	+11.7885 0.746938	+0.02379 1.1139	+0.001367 2.9665	+0.1190 5.1292
AVR.21 (OH) (2446541.5)	X:	-0.7246	-0.00868	+27.8696 6.170272	+0.05296 0.8064	+0.000850 3.3873	+0.2813 5.0048
A AVR.23 (OH)	Y:	-0.1667	+0.00575	+11.8309 1.516293	+0.02429 2.0863	+0.001207 5.9965	+0.1193 0.3498
AVR.23 (OH) (2446543.5)	X:	-0.7421	-0.00775	+27.9328 0.657761	+0.05081 1.6583	+0.001370 0.1951	+0.2819 0.2268
A AVR.25 (OH)	Y:	-0.1554	+0.00548	+11.8719 2.285934	+0.02157 2.8174	+0.000725 2.6761	+0.1199 1.8538
AVR.25 (OH) (2446545.5)	X:	-0.7573	-0.00810	+27.9912 1.428552	+0.04650 2.3514	+0.002651 2.7977	+0.2824 1.7324
A AVR.27 (OH)	Y:	-0.1445	+0.00591	+11.9104 3.055586	+0.02360 3.5396	+0.000797 5.2922	+0.1203 3.3577
AVR.27 (OH) (2446547.5)	X:	-0.7742	-0.00621	+28.0443 2.199125	+0.05885 3.1244	+0.003784 5.6463	+0.2830 3.2362
A AVR.29 (OH)	Y:	-0.1330	+0.00606	+11.9489 3.825324	+0.02371 4.3313	+0.000842 6.1698	+0.1205 4.8627
AVR.29 (OH) (2446549.5)	X:	-0.7875	-0.00662	+28.1002 2.969932	+0.05399 3.9968	+0.000534 1.1312	+0.2831 4.7422
A AVR.31 (OH)	Y:	-0.1203	+0.00561	+11.9869 4.594891	+0.02702 5.3165	+0.001962 2.5543	+0.1209 0.0808
MAI 1 (OH) (2446551.5)	X:	-0.7989	-0.00698	+28.1558 3.740609	+0.05771 4.9731	+0.004143 2.6551	+0.2837 6.2433
A MAI 3 (OH)	Y:	-0.1089	+0.00655	+12.0246 5.364963	+0.02092 6.0563	+0.001261 5.9744	+0.1211 1.5862
MAI 3 (OH) (2446553.5)	X:	-0.8129	-0.00424	+28.2013 4.511685	+0.04426 5.5685	+0.004554 6.0400	+0.2842 1.4663
A MAI 5 (OH)	Y:	-0.0967	+0.00661	+12.0611 6.134910	+0.02058 0.6627	+0.000889 6.1938	+0.1215 3.0860
MAI 5 (OH) (2446555.5)	X:	-0.8232	-0.00461	+28.2472 5.282529	+0.04802 0.1538	+0.000930 1.2612	+0.2848 2.9675
A MAI 7 (OH)	Y:	-0.0832	+0.00597	+12.0926 0.621876	+0.02204 1.1960	+0.002238 2.8754	+0.1220 4.5915
MAI 7 (OH) (2446557.5)	X:	-0.8316	-0.00488	+28.2847 6.053364	+0.05228 0.8480	+0.003738 2.9317	+0.2857 4.4736
A MAI 9 (OH)	Y:	-0.0707	+0.00674	+12.1258 1.391906	+0.02243 2.1913	+0.000819 5.5973	+0.1224 6.0932
MAI 9 (OH) (2446559.5)	X:	-0.8409	-0.00295	+28.3251 0.541057	+0.05009 1.8291	+0.002252 5.8979	+0.2862 5.9774
A MAI 11 (OH)	Y:	-0.0576	+0.00674	+12.1566 2.162058	+0.02180 2.9881	+0.000464 0.1719	+0.1229 1.3153

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES					
		DU SATELLITE 1 DE SATURNE: MIMAS				N=6.667	
		A0	A1	B0 FO	B1 F1	B2 F2	C0 PO
MAI 11 (OH) (2446561.5)	X:	-0.8469	-0.00322	+28.3580 1.312028	+0.04357 2.5533	+0.001788 2.4508	+0.2866 1.1996
A MAI 13 (OH)	Y:	-0.0441	+0.00661	+12.1860 2.932300	+0.02000 3.7858	+0.000542 3.3106	+0.1232 2.8194
MAI 13 (OH) (2446563.5)	X:	-0.8533	-0.00201	+28.3866 2.082822	+0.04809 3.3007	+0.001258 5.1627	+0.2870 2.7047
A MAI 15 (OH)	Y:	-0.0311	+0.00711	+12.2123 3.702614	+0.02048 4.4044	+0.001539 5.8708	+0.1233 4.3237
MAI 15 (OH) (2446565.5)	X:	-0.8586	-0.00084	+28.4099 2.853650	+0.05056 3.9904	+0.003584 5.9663	+0.2866 4.2087
A MAI 17 (OH)	Y:	-0.0168	+0.00652	+12.2393 4.472687	+0.02380 5.4069	+0.001469 2.3776	+0.1237 5.8275
MAI 17 (OH) (2446567.5)	X:	-0.8595	-0.00208	+28.4401 3.624368	+0.05476 5.0948	+0.004797 2.5441	+0.2874 5.7122
A MAI 19 (OH)	Y:	-0.0031	+0.00681	+12.2637 5.243010	+0.02271 6.1795	+0.000627 2.6304	+0.1236 1.0478
MAI 19 (OH) (2446569.5)	X:	-0.8622	+0.00003	+28.4577 4.395259	+0.04703 5.7836	+0.000956 0.0649	+0.2868 0.9327
A MAI 21 (OH)	Y:	+0.0098	+0.00750	+12.2900 6.013428	+0.01867 0.9582	+0.002058 5.9296	+0.1241 2.5496
MAI 21 (OH) (2446571.5)	X:	-0.8640	+0.00146	+28.4764 5.166223	+0.03846 0.4380	+0.003719 6.1510	+0.2878 2.4347
A MAI 23 (OH)	Y:	+0.0244	+0.00662	+12.3092 0.500664	+0.01934 1.4460	+0.001623 2.8358	+0.1241 4.0537
MAI 23 (OH) (2446573.5)	X:	-0.8614	+0.00022	+28.4840 5.936881	+0.04585 0.9970	+0.004436 2.8244	+0.2876 3.9394
A MAI 25 (OH)	Y:	+0.0384	+0.00678	+12.3291 1.271142	+0.01801 2.2951	+0.000840 3.3954	+0.1247 5.5553
MAI 25 (OH) (2446575.5)	X:	-0.8597	+0.00190	+28.4933 0.424443	+0.04416 1.9520	+0.000975 4.8704	+0.2884 5.4422
A MAI 27 (OH)	Y:	+0.0519	+0.00727	+12.3467 2.041441	+0.02121 3.1513	+0.001513 6.0066	+0.1248 0.7772
MAI 27 (OH) (2446577.5)	X:	-0.8561	+0.00265	+28.4978 1.195124	+0.04318 2.8008	+0.001276 0.1780	+0.2884 0.6640
A MAI 29 (OH)	Y:	+0.0662	+0.00674	+12.3636 2.811930	+0.01788 4.0567	+0.000745 2.6722	+0.1251 2.2808
MAI 29 (OH) (2446579.5)	X:	-0.8506	+0.00270	+28.4976 1.965797	+0.03805 3.6259	+0.001594 2.8718	+0.2885 2.1688
A MAI 31 (OH)	Y:	+0.0796	+0.00708	+12.3766 3.582412	+0.01691 4.6766	+0.000986 5.6312	+0.1253 3.7848
MAI 31 (OH) (2446581.5)	X:	-0.8461	+0.00467	+28.4884 2.736277	+0.04124 4.1392	+0.004333 5.8409	+0.2882 3.6714
A JUN. 2 (OH)	Y:	+0.0936	+0.00684	+12.3895 4.352778	+0.01795 5.5345	+0.000449 0.9652	+0.1254 5.2899
JUN. 2 (OH) (2446583.5)	X:	-0.8371	+0.00389	+28.4853 3.506729	+0.04421 5.1891	+0.002231 2.1600	+0.2881 5.1766
A JUN. 4 (OH)	Y:	+0.1079	+0.00634	+12.3993 5.123011	+0.02224 0.0173	+0.002038 2.6442	+0.1253 0.5080
JUN. 4 (OH) (2446585.5)	X:	-0.8273	+0.00426	+28.4751 4.277023	+0.04928 5.9860	+0.003626 2.6014	+0.2875 0.3936
A JUN. 6 (OH)	Y:	+0.1205	+0.00717	+12.4114 5.893534	+0.01786 1.1349	+0.001708 5.7921	+0.1255 2.0128

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES					
		DU SATELLITE 1 DE SATURNE: MIMAS				N=6.667	
		AO	A1	BO FO	B1 F1	B2 F2	CO PO
JUN. 6 (OH)	X:	-0.8195	+0.00696	+28.4623	+0.03457	+0.004749	+0.2879
(2446587.5)				5.047656	0.7729	5.9997	1.8980
A JUN. 8 (OH)	Y:	+0.1340	+0.00670	+12.4188	+0.01855	+0.000223	+0.1253
				0.380695	1.8547	5.5773	3.5131
JUN. 8 (OH)	X:	-0.8072	+0.00604	+28.4427	+0.03853	+0.001777	+0.2873
(2446589.5)				5.817863	1.3823	2.6739	3.3986
A JUN. 10 (OH)	Y:	+0.1480	+0.00601	+12.4234	+0.01359	+0.002038	+0.1258
				1.151273	2.5159	3.0082	5.0170
JUN. 10 (OH)	X:	-0.7939	+0.00624	+28.4173	+0.03471	+0.002992	+0.2879
(2446591.5)				0.304923	2.1235	3.1792	4.9024
A JUN. 12 (OH)	Y:	+0.1604	+0.00666	+12.4274	+0.01839	+0.001465	+0.1257
				1.921497	3.3697	5.8178	0.2360
JUN. 12 (OH)	X:	-0.7811	+0.00803	+28.3933	+0.04159	+0.002966	+0.2875
(2446593.5)				1.074987	3.0610	5.9545	0.1219
A JUN. 14 (OH)	Y:	+0.1733	+0.00626	+12.4296	+0.01683	+0.000395	+0.1260
				2.691852	4.2518	0.7560	1.7398
JUN. 14 (OH)	X:	-0.7652	+0.00758	+28.3634	+0.03521	+0.001680	+0.2874
(2446595.5)				1.845105	4.0090	2.3560	1.6257
A JUN. 16 (OH)	Y:	+0.1858	+0.00603	+12.4300	+0.01576	+0.000375	+0.1260
				3.462174	5.1087	3.4099	3.2434
JUN. 16 (OH)	X:	-0.7502	+0.00897	+28.3261	+0.03296	+0.002070	+0.2872
(2446597.5)				2.614968	4.6006	5.6970	3.1284
A JUN. 18 (OH)	Y:	+0.1976	+0.00620	+12.4280	+0.01306	+0.001150	+0.1259
				4.232502	5.8412	5.9809	4.7475
JUN. 18 (OH)	X:	-0.7334	+0.00948	+28.2879	+0.03090	+0.002170	+0.2862
(2446599.5)				3.384802	5.4036	0.0298	4.6320
A JUN. 20 (OH)	Y:	+0.2104	+0.00536	+12.4242	+0.01860	+0.001965	+0.1259
				5.002477	0.2231	2.5661	6.2493
JUN. 20 (OH)	X:	-0.7130	+0.00833	+28.2518	+0.04581	+0.005596	+0.2861
(2446601.5)				4.154277	6.2138	2.5891	6.1320
A JUN. 22 (OH)	Y:	+0.2216	+0.00568	+12.4205	+0.01655	+0.000268	+0.1256
				5.772699	1.1839	4.4189	1.4703
JUN. 22 (OH)	X:	-0.6955	+0.01070	+28.2083	+0.03525	+0.002084	+0.2851
(2446603.5)				4.924063	0.9785	5.8992	1.3523
A JUN. 24 (OH)	Y:	+0.2321	+0.00591	+12.4172	+0.01974	+0.001935	+0.1257
				0.259555	2.1993	5.8030	2.9695
JUN. 24 (OH)	X:	-0.6762	+0.01126	+28.1657	+0.03948	+0.002535	+0.2850
(2446605.5)				5.693613	1.9091	5.9953	2.8507
A JUN. 26 (OH)	Y:	+0.2438	+0.00476	+12.4077	+0.01271	+0.001912	+0.1255
				1.029806	2.8894	2.9225	4.4738
JUN. 26 (OH)	X:	-0.6534	+0.00992	+28.1104	+0.02894	+0.004503	+0.2846
(2446607.5)				0.179817	2.5058	2.9744	4.3543
A JUN. 28 (OH)	Y:	+0.2541	+0.00496	+12.3993	+0.01481	+0.000377	+0.1256
				1.799830	3.7474	4.5183	5.9733
JUN. 28 (OH)	X:	-0.6323	+0.01163	+28.0597	+0.03715	+0.001958	+0.2844
(2446609.5)				0.949076	3.3950	5.5751	5.8542
A JUN. 30 (OH)	Y:	+0.2638	+0.00509	+12.3877	+0.01568	+0.001470	+0.1256
				2.569725	4.4082	6.1665	1.1943
JUN. 30 (OH)	X:	-0.6094	+0.01181	+28.0041	+0.03707	+0.001368	+0.2840
(2446611.5)				1.718247	4.2749	0.5044	1.0741
A JUL. 2 (OH)	Y:	+0.2738	+0.00437	+12.3766	+0.01639	+0.000933	+0.1256
				3.339660	5.4434	2.7017	2.6963

1986

COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 1 DE SATURNE: MIMAS

N=6.667

		AO	A1	BO FO	B1 F1	B2 F2	CO PO
JUL. 2 (OH) (2446613.5)	X:	-0.5858	+0.01183	+27.9450 2.487300	+0.03584 5.1670	+0.000923 2.7542	+0.2835 2.5762
A JUL. 4 (OH)	Y:	+0.2824	+0.00456	+12.3621 4.109598	+0.01278 6.2742	+0.000939 5.6277	+0.1254 4.1993
JUL. 4 (OH) (2446615.5)	X:	-0.5631	+0.01323	+27.8786 3.256220	+0.02587 5.9230	+0.003678 5.9327	+0.2824 4.0771
A JUL. 6 (OH)	Y:	+0.2915	+0.00398	+12.3469 4.879249	+0.01467 0.6323	+0.000667 2.2661	+0.1253 5.7024
JUL. 6 (OH) (2446617.5)	X:	-0.5364	+0.01188	+27.8189 4.024818	+0.03850 0.2962	+0.003779 2.4621	+0.2820 5.5790
A JUL. 8 (OH)	Y:	+0.3002	+0.00353	+12.3292 5.648676	+0.01455 1.2474	+0.001635 2.8298	+0.1248 0.9202
JUL. 8 (OH) (2446619.5)	X:	-0.5108	+0.01254	+27.7518 4.793400	+0.03648 1.0884	+0.002433 2.7854	+0.2805 0.7951
A JUL. 10 (OH)	Y:	+0.3069	+0.00417	+12.3154 0.135289	+0.01946 2.4017	+0.002217 5.7273	+0.1249 2.4219
JUL. 10 (OH) (2446621.5)	X:	-0.4870	+0.01454	+27.6894 5.562104	+0.04557 2.2419	+0.004983 5.8770	+0.2806 2.2952
A JUL. 12 (OH)	Y:	+0.3145	+0.00328	+12.2958 0.904875	+0.01573 3.1491	+0.000310 3.2383	+0.1243 3.9226
JUL. 12 (OH) (2446623.5)	X:	-0.4592	+0.01289	+27.6152 0.047248	+0.03509 2.9337	+0.002541 2.9243	+0.2793 3.7949
A JUL. 14 (OH)	Y:	+0.3218	+0.00267	+12.2765 1.674559	+0.01404 4.2228	+0.001627 3.0014	+0.1246 5.4230
JUL. 14 (OH) (2446625.5)	X:	-0.4318	+0.01315	+27.5415 0.815580	+0.03547 3.8341	+0.001843 3.3865	+0.2794 5.2946
A JUL. 16 (OH)	Y:	+0.3273	+0.00319	+12.2546 2.443838	+0.01473 4.6705	+0.001715 5.9945	+0.1242 0.6417
JUL. 16 (OH) (2446627.5)	X:	-0.4054	+0.01437	+27.4679 1.583616	+0.03975 4.4871	+0.003141 6.1410	+0.2785 0.5123
A JUL. 18 (OH)	Y:	+0.3333	+0.00253	+12.2331 3.213211	+0.01586 5.6426	+0.000459 1.8395	+0.1243 2.1428
JUL. 18 (OH) (2446629.5)	X:	-0.3770	+0.01354	+27.3922 2.351674	+0.04309 5.4604	+0.001867 2.3424	+0.2779 2.0132
A JUL. 20 (OH)	Y:	+0.3383	+0.00229	+12.2099 3.982505	+0.01557 0.2330	+0.000435 3.6998	+0.1240 3.6449
JUL. 20 (OH) (2446631.5)	X:	-0.3503	+0.01459	+27.3096 3.119524	+0.03483 0.0401	+0.002150 5.7078	+0.2771 3.5129
A JUL. 22 (OH)	Y:	+0.3428	+0.00222	+12.1856 4.751720	+0.01447 1.1183	+0.000713 5.9150	+0.1237 5.1476
JUL. 22 (OH) (2446633.5)	X:	-0.3218	+0.01424	+27.2306 3.887205	+0.03723 0.7987	+0.000735 0.8317	+0.2759 5.0146
A JUL. 24 (OH)	Y:	+0.3477	+0.00135	+12.1585 5.520646	+0.01289 1.5122	+0.001972 2.6982	+0.1234 0.3641
JUL. 24 (OH) (2446635.5)	X:	-0.2917	+0.01309	+27.1496 4.654518	+0.03736 1.2683	+0.005238 2.7063	+0.2750 0.2281
A JUL. 26 (OH)	Y:	+0.3506	+0.00174	+12.1346 0.006481	+0.01644 2.5475	+0.000940 5.4166	+0.1230 1.8670
JUL. 26 (OH) (2446637.5)	X:	-0.2652	+0.01521	+27.0711 5.422155	+0.04699 2.3895	+0.003530 5.7510	+0.2741 1.7295
A JUL. 28 (OH)	Y:	+0.3532	+0.00162	+12.1091 0.775266	+0.01896 3.2621	+0.001660 5.8052	+0.1226 3.3642

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES					
		DU SATELLITE 1 DE SATURNE: MIMAS				N=6.667	
		AO	A1	B0 FO	B1 F1	B2 F2	CO PO
JUL.28 (OH)	X:	-0.2369	+0.01476	+26.9901	+0.04789	+0.001797	+0.2731
(2446639.5)				6.189419	3.1216	5.8417	3.2249
A JUL.30 (OH)	Y:	+0.3566	+0.00045	+12.0813	+0.01552	+0.002052	+0.1225
				1.544378	4.4529	2.8591	4.8667
JUL.30 (OH)	X:	-0.2066	+0.01326	+26.9009	+0.04044	+0.004107	+0.2727
(2446641.5)				0.673525	4.1362	2.9835	4.7258
A JUL.32 (OH)	Y:	+0.3582	+0.00078	+12.0534	+0.01590	+0.000541	+0.1222
				2.313066	5.0391	5.6952	0.0813
AOU. 1 (OH)	X:	-0.1790	+0.01469	+26.8174	+0.04391	+0.002461	+0.2718
(2446643.5)				1.440498	4.7277	5.8949	6.2230
A AOU. 3 (OH)	Y:	+0.3594	+0.00070	+12.0233	+0.01439	+0.001151	+0.1221
				3.081733	5.8045	0.0367	1.5833
AOU. 3 (OH)	X:	-0.1502	+0.01427	+26.7313	+0.04652	+0.001262	+0.2712
(2446645.5)				2.207429	5.5757	0.9909	1.4401
A AOU. 5 (OH)	Y:	+0.3606	+0.00000	+11.9947	+0.01767	+0.001081	+0.1218
				3.850311	0.3502	2.8853	3.0835
AOU. 5 (OH)	X:	-0.1217	+0.01407	+26.6433	+0.04726	+0.000811	+0.2704
(2446647.5)				2.974228	0.1476	3.1029	2.9391
A AOU. 7 (OH)	Y:	+0.3606	+0.00014	+11.9640	+0.01658	+0.000902	+0.1215
				4.618909	1.3341	5.5044	4.5850
AOU. 7 (OH)	X:	-0.0944	+0.01476	+26.5527	+0.04449	+0.002692	+0.2690
(2446649.5)				3.740939	1.0913	5.8520	4.4384
A AOU. 9 (OH)	Y:	+0.3609	-0.00052	+11.9318	+0.01420	+0.000914	+0.1212
				5.387188	1.9326	2.5491	6.0855
AOU. 9 (OH)	X:	-0.0643	+0.01304	+26.4661	+0.04139	+0.004279	+0.2685
(2446651.5)				4.507184	1.5630	2.6285	5.9364
A AOU.11 (OH)	Y:	+0.3604	-0.00076	+11.8997	+0.01318	+0.000969	+0.1206
				6.155498	2.7443	3.0258	1.3031
AOU.11 (OH)	X:	-0.0367	+0.01379	+26.3775	+0.04370	+0.000901	+0.2667
(2446653.5)				5.273594	2.4628	3.4142	1.1516
A AOU.13 (OH)	Y:	+0.3583	-0.00025	+11.8707	+0.01962	+0.002403	+0.1204
				0.640349	3.3737	5.7747	2.8012
AOU.13 (OH)	X:	-0.0109	+0.01497	+26.2964	+0.05729	+0.005046	+0.2664
(2446655.5)				6.039900	3.1965	5.8516	2.6473
A AOU.15 (OH)	Y:	+0.3573	-0.00128	+11.8376	+0.01660	+0.000822	+0.1198
				1.408619	4.4221	2.7697	4.3020
AOU.15 (OH)	X:	+0.0182	+0.01281	+26.2032	+0.04757	+0.003089	+0.2650
(2446657.5)				0.522893	4.1730	2.8762	4.1462
A AOU.17 (OH)	Y:	+0.3556	-0.00163	+11.8064	+0.01907	+0.001279	+0.1198
				2.176775	5.3059	2.9148	5.7988
AOU.17 (OH)	X:	+0.0456	+0.01309	+26.1154	+0.05093	+0.001000	+0.2648
(2446659.5)				1.288980	4.9430	3.3949	5.6419
A AOU.19 (OH)	Y:	+0.3523	-0.00113	+11.7715	+0.01438	+0.001714	+0.1194
				2.944653	5.9758	6.0768	1.0169
AOU.19 (OH)	X:	+0.0716	+0.01380	+26.0268	+0.04778	+0.002815	+0.2638
(2446661.5)				2.054784	5.6355	6.2803	0.8579
A AOU.21 (OH)	Y:	+0.3496	-0.00184	+11.7388	+0.01767	+0.000660	+0.1192
				3.712534	0.4831	2.4532	2.5154
AOU.21 (OH)	X:	+0.0988	+0.01270	+25.9397	+0.05458	+0.001959	+0.2632
(2446663.5)				2.820619	0.1735	2.5691	2.3558
A AOU.23 (OH)	Y:	+0.3459	-0.00197	+11.7051	+0.01806	+0.000515	+0.1188
				4.480349	1.3432	4.0436	4.0162

1986

COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 1 DE SATURNE: MIMAS

N=6.667

		AO	A1	BO FO	B1 F1	B2 F2	CO PO
AOU.23 (OH) (2446665.5)	X:	+0.1238	+0.01337	+25.8482 3.586349	+0.05214 1.1126	+0.002087 5.5163	+0.2621 3.8534
A AOU.25 (OH)	Y:	+0.3419	-0.00208	+11.6707 5.248038	+0.01775 2.1855	+0.000453 5.8928	+0.1185 5.5169
AOU.25 (OH) (2446667.5)	X:	+0.1502	+0.01247	+25.7614 4.351793	+0.05021 1.8032	+0.000790 2.3131	+0.2612 5.3526
A AOU.27 (OH)	Y:	+0.3382	-0.00277	+11.6340 6.015572	+0.01294 2.9749	+0.001672 2.7324	+0.1180 0.7321
AOU.27 (OH) (2446669.5)	X:	+0.1768	+0.01148	+25.6719 5.117035	+0.04174 2.5228	+0.004096 2.7881	+0.2597 0.5643
A AOU.29 (OH)	Y:	+0.3326	-0.00225	+11.6019 0.499780	+0.01794 3.5731	+0.001464 5.6429	+0.1177 2.2328
AOU.29 (OH) (2446671.5)	X:	+0.1995	+0.01326	+25.5922 5.882483	+0.05831 3.2615	+0.004547 5.7774	+0.2592 2.0629
A AOU.31 (OH)	Y:	+0.3273	-0.00254	+11.5672 1.267082	+0.01714 4.3083	+0.001125 5.9075	+0.1170 3.7294
AOU.31 (OH) (2446673.5)	X:	+0.2240	+0.01209	+25.5064 0.364458	+0.05378 4.0642	+0.000852 5.9231	+0.2578 3.5569
A SEP. 2 (OH)	Y:	+0.3226	-0.00351	+11.5339 2.034657	+0.02109 5.4068	+0.002151 2.7899	+0.1169 5.2290
SEP. 2 (OH) (2446675.5)	X:	+0.2494	+0.01065	+25.4191 1.129774	+0.05739 5.0393	+0.003894 2.9127	+0.2577 5.0547
A SEP. 4 (OH)	Y:	+0.3162	-0.00296	+11.4982 2.801791	+0.01721 6.0890	+0.000837 5.9476	+0.1164 0.4431
SEP. 4 (OH) (2446677.5)	X:	+0.2716	+0.01192	+25.3356 1.894675	+0.05150 5.6837	+0.002588 6.0342	+0.2565 0.2672
A SEP. 6 (OH)	Y:	+0.3097	-0.00310	+11.4625 3.568978	+0.01694 0.6615	+0.000804 0.1186	+0.1163 1.9424
SEP. 6 (OH) (2446679.5)	X:	+0.2947	+0.01113	+25.2524 2.659621	+0.05523 0.1962	+0.000988 1.4884	+0.2561 1.7650
A SEP. 8 (OH)	Y:	+0.3033	-0.00368	+11.4281 4.335981	+0.01874 1.3293	+0.001109 3.0575	+0.1159 3.4415
SEP. 8 (OH) (2446681.5)	X:	+0.3168	+0.01080	+25.1689 3.424484	+0.05704 1.0218	+0.000990 3.6657	+0.2553 3.2620
A SEP.10 (OH)	Y:	+0.2960	-0.00345	+11.3931 5.103020	+0.02008 2.2572	+0.000880 5.5171	+0.1156 4.9415
SEP.10 (OH) (2446683.5)	X:	+0.3378	+0.01103	+25.0862 4.189273	+0.05839 1.8873	+0.002076 5.7279	+0.2541 4.7601
A SEP.12 (OH)	Y:	+0.2893	-0.00402	+11.3560 5.869815	+0.01602 3.0794	+0.000976 2.5385	+0.1152 0.1567
SEP.12 (OH) (2446685.5)	X:	+0.3608	+0.00931	+25.0041 4.953641	+0.04581 2.5754	+0.004033 2.6783	+0.2534 6.2552
A SEP.14 (OH)	Y:	+0.2816	-0.00399	+11.3210 0.353396	+0.01677 3.8517	+0.000377 3.3820	+0.1146 1.6571
SEP.14 (OH) (2446687.5)	X:	+0.3804	+0.01017	+24.9267 5.718257	+0.05337 3.3526	+0.000974 5.2849	+0.2520 1.4702
A SEP.16 (OH)	Y:	+0.2729	-0.00355	+11.2873 1.119813	+0.01733 4.3005	+0.002228 5.8396	+0.1143 3.1527
SEP.16 (OH) (2446689.5)	X:	+0.3989	+0.01072	+24.8549 0.199461	+0.05760 3.9657	+0.004513 5.8907	+0.2515 2.9629
A SEP.18 (OH)	Y:	+0.2656	-0.00453	+11.2527 1.886616	+0.02013 5.3993	+0.001351 2.6765	+0.1138 4.6532

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES					
		DU SATELLITE 1 DE SATURNE: MIMAS				N=6.667	
		AO	A1	BO FO	B1 F1	B2 F2	CO PO
SEP. 18 (OH)	X:	+0.4201	+0.00843	+24.7743	+0.05854	+0.003750	+0.2505
(2446691.5)				0.964016	5.0053	2.8030	4.4611
A SEP. 20 (OH)	Y:	+0.2574	-0.00454	+11.2193	+0.02122	+0.000926	+0.1135
				2.653126	6.1264	2.8545	6.1477
SEP. 20 (OH)	X:	+0.4386	+0.00889	+24.7007	+0.05810	+0.000475	+0.2501
(2446693.5)				1.728352	5.7149	3.4345	5.9543
A SEP. 22 (OH)	Y:	+0.2481	-0.00400	+11.1824	+0.01725	+0.001654	+0.1132
				3.419564	0.7834	6.0880	1.3649
SEP. 22 (OH)	X:	+0.4560	+0.00930	+24.6254	+0.05289	+0.002417	+0.2495
(2446695.5)				2.492516	0.2160	0.0166	1.1693
A SEP. 24 (OH)	Y:	+0.2396	-0.00465	+11.1487	+0.01911	+0.000836	+0.1129
				4.185865	1.4043	2.7405	2.8615
SEP. 24 (OH)	X:	+0.4741	+0.00809	+24.5542	+0.05837	+0.001956	+0.2489
(2446697.5)				3.256725	0.9469	2.8444	2.6652
A SEP. 26 (OH)	Y:	+0.2304	-0.00460	+11.1144	+0.02010	+0.000520	+0.1126
				4.952136	2.2402	4.3413	4.3612
SEP. 26 (OH)	X:	+0.4900	+0.00857	+24.4811	+0.06081	+0.002116	+0.2480
(2446699.5)				4.020921	1.8449	5.4029	4.1621
A SEP. 28 (OH)	Y:	+0.2212	-0.00465	+11.0796	+0.01984	+0.000320	+0.1123
				5.718283	3.0776	6.2175	5.8601
SEP. 28 (OH)	X:	+0.5071	+0.00748	+24.4111	+0.05398	+0.001148	+0.2474
(2446701.5)				4.784801	2.5883	2.5012	5.6593
A SEP. 30 (OH)	Y:	+0.2123	-0.00509	+11.0437	+0.01774	+0.001308	+0.1117
				0.201181	4.0231	2.6982	1.0750
SEP. 30 (OH)	X:	+0.5236	+0.00679	+24.3403	+0.04885	+0.002872	+0.2460
(2446703.5)				5.548671	3.4341	2.8070	0.8710
A OCT. 2 (OH)	Y:	+0.2019	-0.00445	+11.0116	+0.01775	+0.001708	+0.1115
				0.966924	4.4676	5.7557	2.5733
OCT. 2 (OH)	X:	+0.5364	+0.00830	+24.2818	+0.05723	+0.004891	+0.2458
(2446705.5)				0.029379	3.9623	5.8293	2.3671
A OCT. 4 (OH)	Y:	+0.1923	-0.00482	+10.9777	+0.01759	+0.000510	+0.1108
				1.732786	5.3414	6.1851	4.0704
OCT. 4 (OH)	X:	+0.5514	+0.00673	+24.2155	+0.05489	+0.000385	+0.2444
(2446707.5)				0.793224	4.8711	2.2213	3.8615
A OCT. 6 (OH)	Y:	+0.1833	-0.00549	+10.9471	+0.02360	+0.002125	+0.1108
				2.498735	6.1398	2.7590	5.5670
OCT. 6 (OH)	X:	+0.5664	+0.00558	+24.1532	+0.06313	+0.003724	+0.2446
(2446709.5)				1.557233	5.7145	2.8714	5.3567
A OCT. 8 (OH)	Y:	+0.1727	-0.00474	+10.9125	+0.01890	+0.001124	+0.1102
				3.264397	0.7553	5.9756	0.7815
OCT. 8 (OH)	X:	+0.5781	+0.00682	+24.0911	+0.05263	+0.002731	+0.2436
(2446711.5)				2.320840	0.1978	6.0447	0.5694
A OCT. 10 (OH)	Y:	+0.1625	-0.00491	+10.8798	+0.02000	+0.000501	+0.1101
				4.030089	1.5492	0.1579	2.2782
OCT. 10 (OH)	X:	+0.5908	+0.00583	+24.0322	+0.05627	+0.000785	+0.2435
(2446713.5)				3.084574	0.9427	2.0667	2.0654
A OCT. 12 (OH)	Y:	+0.1527	-0.00530	+10.8479	+0.01940	+0.001059	+0.1097
				4.795552	2.2194	3.1712	3.7769
OCT. 12 (OH)	X:	+0.6024	+0.00552	+23.9742	+0.05842	+0.001172	+0.2428
(2446715.5)				3.848276	1.7405	3.9999	3.5618
A OCT. 14 (OH)	Y:	+0.1422	-0.00497	+10.8163	+0.02182	+0.000840	+0.1095
				5.561066	3.0599	5.6563	5.2753

1986

COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 1 DE SATURNE: MIMAS

N=6.667

	A0	A1	B0 FO	B1 F1	B2 F2	C0 PO
OCT. 14 (OH) (2446717.5)	X: +0.6131	+0.00554	+23.9180 4.611917	+0.05995 2.5615	+0.001680 5.7311	+0.2421 5.0594
A OCT. 16 (OH)	Y: +0.1324	-0.00540	+10.7829 0.043255	+0.01969 4.0045	+0.000964 2.4450	+0.1091 0.4895
OCT. 16 (OH) (2446719.5)	X: +0.6252	+0.00400	+23.8603 5.375286	+0.04857 3.4320	+0.003596 2.6544	+0.2414 0.2704
A OCT. 18 (OH)	Y: +0.1218	-0.00513	+10.7525 0.808468	+0.01954 4.6903	+0.000217 5.1317	+0.1087 1.9892
OCT. 18 (OH) (2446721.5)	X: +0.6337	+0.00501	+23.8122 6.138856	+0.05385 4.0614	+0.001882 5.6765	+0.2406 1.7684
A OCT. 20 (OH)	Y: +0.1108	-0.00476	+10.7217 1.573418	+0.01606 5.3231	+0.001851 5.9003	+0.1082 3.4837
OCT. 20 (OH) (2446723.5)	X: +0.6418	+0.00510	+23.7658 0.619028	+0.05041 4.7205	+0.003577 5.9418	+0.2400 3.2603
A OCT. 22 (OH)	Y: +0.1013	-0.00562	+10.6935 2.338733	+0.02273 6.1688	+0.001759 2.6652	+0.1080 4.9831
OCT. 22 (OH) (2446725.5)	X: +0.6523	+0.00289	+23.7161 1.382764	+0.06135 5.6812	+0.004348 2.7788	+0.2397 4.7582
A OCT. 24 (OH)	Y: +0.0909	-0.00531	+10.6644 3.103706	+0.02126 0.6441	+0.000519 2.8683	+0.1075 0.1936
OCT. 24 (OH) (2446727.5)	X: +0.6597	+0.00365	+23.6713 2.146167	+0.05561 0.1334	+0.000286 5.0853	+0.2391 6.2508
A OCT. 26 (OH)	Y: +0.0798	-0.00478	+10.6337 3.868782	+0.02122 1.6425	+0.001573 6.0605	+0.1075 1.6925
OCT. 26 (OH) (2446729.5)	X: +0.6662	+0.00385	+23.6250 2.909563	+0.05273 0.9806	+0.002113 6.2362	+0.2391 1.4654
A OCT. 28 (OH)	Y: +0.0699	-0.00536	+10.6058 4.633570	+0.01988 2.2562	+0.000973 2.8913	+0.1071 3.1884
OCT. 28 (OH) (2446731.5)	X: +0.6734	+0.00264	+23.5846 3.672985	+0.05466 1.6570	+0.001982 3.0565	+0.2387 2.9607
A OCT. 30 (OH)	Y: +0.0593	-0.00515	+10.5779 5.398390	+0.02136 3.0612	+0.000480 4.6822	+0.1070 4.6871
OCT. 30 (OH) (2446733.5)	X: +0.6786	+0.00307	+23.5436 4.436467	+0.05932 2.5062	+0.002100 5.4206	+0.2382 4.4579
A OCT. 32 (OH)	Y: +0.0491	-0.00514	+10.5498 6.163117	+0.02161 3.9051	+0.000326 0.4910	+0.1067 6.1846
NOV. 1 (OH) (2446735.5)	X: +0.6849	+0.00196	+23.5035 5.199687	+0.05178 3.3461	+0.001392 2.4175	+0.2379 5.9541
A NOV. 3 (OH)	Y: +0.0391	-0.00535	+10.5220 0.644616	+0.02190 4.8034	+0.000986 2.6274	+0.1062 1.3997
NOV. 3 (OH) (2446737.5)	X: +0.6901	+0.00160	+23.4657 5.963019	+0.05110 4.1849	+0.001840 2.7853	+0.2368 1.1671
A NOV. 5 (OH)	Y: +0.0281	-0.00468	+10.4962 1.408883	+0.01725 5.4037	+0.001738 5.8171	+0.1060 2.8958
NOV. 5 (OH) (2446739.5)	X: +0.6922	+0.00288	+23.4387 0.443032	+0.04749 4.6773	+0.004788 5.8666	+0.2369 2.6616
A NOV. 7 (OH)	Y: +0.0182	-0.00509	+10.4709 2.173421	+0.01984 6.2398	+0.000250 1.7742	+0.1054 4.3937
NOV. 7 (OH) (2446741.5)	X: +0.6968	+0.00107	+23.4052 1.206466	+0.05273 5.6228	+0.001585 2.5928	+0.2359 4.1579
A NOV. 9 (OH)	Y: +0.0087	-0.00548	+10.4488 2.937849	+0.02294 0.5760	+0.001957 2.7630	+0.1054 5.8878

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES					
		DU SATELLITE 1 DE SATURNE: MIMAS				N=6.667	
		AO	A1	BO FO	B1 F1	B2 F2	CO PO
NOV. 9 (OH) (2446743.5)	X:	+0.7007	+0.00034	+23.3784 1.969962	+0.05852 0.0684	+0.003343 2.8776	+0.2363 5.6514
A NOV. 11 (OH)	Y:	-0.0020	-0.00462	+10.4227 3.702246	+0.02161 1.6186	+0.001403 5.9449	+0.1050 1.1030
NOV. 11 (OH) (2446745.5)	X:	+0.7016	+0.00157	+23.3481 2.733187	+0.04995 0.9809	+0.003020 6.0063	+0.2357 0.8655
A NOV. 13 (OH)	Y:	-0.0119	-0.00485	+10.3998 4.466556	+0.02196 2.3362	+0.000225 0.2208	+0.1050 2.5975
NOV. 13 (OH) (2446747.5)	X:	+0.7037	+0.00042	+23.3240 3.496562	+0.05149 1.6646	+0.000876 2.6222	+0.2359 2.3607
A NOV. 15 (OH)	Y:	-0.0215	-0.00509	+10.3770 5.230669	+0.02009 3.0904	+0.000959 3.2419	+0.1047 4.0962
NOV. 15 (OH) (2446749.5)	X:	+0.7045	+0.00019	+23.3010 4.259945	+0.05317 2.4436	+0.001220 4.2189	+0.2356 3.8579
A NOV. 17 (OH)	Y:	-0.0316	-0.00470	+10.3555 5.994846	+0.02246 3.8483	+0.000828 5.8697	+0.1046 5.5933
NOV. 17 (OH) (2446751.5)	X:	+0.7048	+0.00013	+23.2795 5.023300	+0.05420 3.2544	+0.001367 5.8901	+0.2354 5.3554
A NOV. 19 (OH)	Y:	-0.0408	-0.00501	+10.3330 0.475791	+0.02301 4.7874	+0.000941 2.3392	+0.1043 0.6072
NOV. 19 (OH) (2446753.5)	X:	+0.7061	-0.00116	+23.2562 5.786553	+0.04954 4.2208	+0.003198 2.6050	+0.2348 0.5672
A NOV. 21 (OH)	Y:	-0.0508	-0.00461	+10.3132 1.239647	+0.02062 5.5009	+0.000468 5.6757	+0.1041 2.3057
NOV. 21 (OH) (2446755.5)	X:	+0.7039	-0.00004	+23.2447 0.266685	+0.04676 4.7799	+0.002564 5.7792	+0.2347 2.0653
A NOV. 23 (OH)	Y:	-0.0607	-0.00434	+10.2929 2.003417	+0.01779 0.0565	+0.001372 5.9545	+0.1036 3.8004
NOV. 23 (OH) (2446757.5)	X:	+0.7019	-0.00036	+23.2314 1.029937	+0.04238 5.5646	+0.002438 6.0023	+0.2340 3.5583
A NOV. 25 (OH)	Y:	-0.0691	-0.00508	+10.2774 2.767402	+0.02269 0.6157	+0.002027 2.6894	+0.1036 5.2981
NOV. 25 (OH) (2446759.5)	X:	+0.7020	-0.00235	+23.2208 1.793629	+0.05646 0.0431	+0.004754 2.7855	+0.2344 5.0559
A NOV. 27 (OH)	Y:	-0.0786	-0.00454	+10.2594 3.531168	+0.02110 1.5047	+0.000106 3.8816	+0.1032 0.5093
NOV. 27 (OH) (2446761.5)	X:	+0.6986	-0.00128	+23.2106 2.556962	+0.04858 0.8960	+0.001024 5.6795	+0.2339 0.2667
A NOV. 29 (OH)	Y:	-0.0882	-0.00410	+10.2421 4.295114	+0.02411 2.3964	+0.001487 6.0100	+0.1033 2.0063
NOV. 29 (OH) (2446763.5)	X:	+0.6950	-0.00132	+23.2009 3.320443	+0.04957 1.7425	+0.001838 6.1470	+0.2345 1.7642
A NOV. 31 (OH)	Y:	-0.0967	-0.00465	+10.2267 5.058690	+0.02026 3.1273	+0.001076 2.9631	+0.1030 3.5024
DEC. 1 (OH) (2446765.5)	X:	+0.6920	-0.00250	+23.1973 4.083900	+0.04666 2.4141	+0.002037 3.1858	+0.2343 3.2605
A DEC. 3 (OH)	Y:	-0.1058	-0.00431	+10.2121 5.822381	+0.02192 3.8840	+0.000455 5.1561	+0.1031 4.9999
DEC. 3 (OH) (2446767.5)	X:	+0.6870	-0.00204	+23.1939 4.847488	+0.05193 3.2095	+0.002065 5.5378	+0.2343 4.7585
A DEC. 5 (OH)	Y:	-0.1143	-0.00428	+10.1979 0.302843	+0.02286 4.7144	+0.000432 0.8858	+0.1029 0.2137

1986

COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 1 DE SATURNE: MIMAS

N=6.667

		A0	A1	B0 FO	B1 F1	B2 F2	C0 PO
DEC. 5 (OH) (2446769.5)	X:	+0.6833	-0.00313	+23.1897 5.610922	+0.04827 4.1471	+0.001660 2.3130	+0.2343 6.2549
A DEC. 7 (OH)	Y:	-0.1227	-0.00436	+10.1849 1.066439	+0.02374 5.5503	+0.000752 2.5598	+0.1027 1.7121
DEC. 7 (OH) (2446771.5)	X:	+0.6779	-0.00319	+23.1908 0.091307	+0.04828 4.9278	+0.000989 2.7638	+0.2337 1.4699
A DEC. 9 (OH)	Y:	-0.1319	-0.00373	+10.1725 1.829690	+0.01845 0.1169	+0.001620 5.8364	+0.1026 3.2070
DEC. 9 (OH) (2446773.5)	X:	+0.6701	-0.00217	+23.1989 0.854680	+0.03644 5.5749	+0.004415 5.8855	+0.2340 2.9640
A DEC.11 (OH)	Y:	-0.1397	-0.00421	+10.1632 2.593256	+0.02131 0.7758	+0.000735 2.4922	+0.1023 4.7056
DEC.11 (OH) (2446775.5)	X:	+0.6651	-0.00415	+23.2043 1.618520	+0.04821 0.0907	+0.002768 2.6801	+0.2336 4.4625
A DEC.13 (OH)	Y:	-0.1473	-0.00435	+10.1560 3.356620	+0.02043 1.4113	+0.001653 2.8105	+0.1022 6.1983
DEC.13 (OH) (2446777.5)	X:	+0.6587	-0.00440	+23.2157 2.382276	+0.04786 0.7879	+0.002660 2.9361	+0.2340 5.9558
A DEC.15 (OH)	Y:	-0.1561	-0.00348	+10.1461 4.120221	+0.02421 2.4184	+0.001697 5.9026	+0.1021 1.4139
DEC.15 (OH) (2446779.5)	X:	+0.6496	-0.00324	+23.2217 3.145980	+0.04746 1.8049	+0.003392 5.9649	+0.2341 1.1717
A DEC.17 (OH)	Y:	-0.1637	-0.00382	+10.1397 4.883593	+0.02228 3.1493	+0.000060 2.2034	+0.1021 2.9075
DEC.17 (OH) (2446781.5)	X:	+0.6421	-0.00458	+23.2362 3.909773	+0.04382 2.4629	+0.001228 2.9030	+0.2345 2.6671
A DEC.19 (OH)	Y:	-0.1711	-0.00395	+10.1332 5.646896	+0.02105 3.9885	+0.000808 3.2539	+0.1022 4.4061
DEC.19 (OH) (2446783.5)	X:	+0.6331	-0.00466	+23.2511 4.673634	+0.04520 3.2344	+0.001151 4.4692	+0.2347 4.1659
A DEC.21 (OH)	Y:	-0.1789	-0.00353	+10.1290 0.127092	+0.02221 4.6858	+0.000862 6.1235	+0.1022 5.9026
DEC.21 (OH) (2446785.5)	X:	+0.6238	-0.00478	+23.2672 5.437518	+0.04647 4.0509	+0.001161 6.2194	+0.2349 5.6640
A DEC.23 (OH)	Y:	-0.1858	-0.00379	+10.1246 0.890507	+0.02453 5.5609	+0.000959 2.2812	+0.1020 1.1170
DEC.23 (OH) (2446787.5)	X:	+0.6151	-0.00587	+23.2824 6.201439	+0.04892 5.0088	+0.002883 2.5596	+0.2346 0.8777
A DEC.25 (OH)	Y:	-0.1935	-0.00333	+10.1221 1.653637	+0.02117 0.1130	+0.000621 5.7042	+0.1021 2.6144
DEC.25 (OH) (2446789.5)	X:	+0.6031	-0.00468	+23.3086 0.682087	+0.03758 5.6747	+0.003049 5.8076	+0.2351 2.3760
A DEC.27 (OH)	Y:	-0.2007	-0.00321	+10.1203 2.416870	+0.02091 0.9782	+0.000854 5.9770	+0.1017 4.1105
DEC.27 (OH) (2446791.5)	X:	+0.5921	-0.00541	+23.3318 1.446087	+0.03852 0.2397	+0.001144 6.1240	+0.2345 3.8718
A DEC.29 (OH)	Y:	-0.2067	-0.00384	+10.1239 3.180143	+0.02006 1.4608	+0.002140 2.7396	+0.1020 5.6065
DEC.29 (OH) (2446793.5)	X:	+0.5825	-0.00711	+23.3621 2.210436	+0.04557 0.7663	+0.004895 2.8149	+0.2355 5.3690
A DEC.31 (OH)	Y:	-0.2139	-0.00313	+10.1245 3.943469	+0.02191 2.4232	+0.000549 5.5872	+0.1017 0.8195

ÉPHÉMÉRIDES DES SATELLITES NATURELS

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES					
		DU SATELLITE 1 DE SATURNE: MIMAS				N=6.667	
		AO	A1	B0 FO	B1 F1	B2 F2	CO PO
DEC.31 (OH)	X:	+0.5693	-0.00575	+23.3877	+0.04336	+0.002073	+0.2352
(2446795.5)				2.974539	1.7961	5.7591	0.5826
A DEC.33 (OH)	Y:	-0.2209	-0.00284	+10.1278	+0.02462	+0.001394	+0.1021
				4.706948	3.1722	5.9770	2.3147
DEC.33 (OH)	X:	+0.5564	-0.00612	+23.4171	+0.04500	+0.001481	+0.2362
(2446797.5)				3.738863	2.5676	6.0673	2.0800
A DEC.35 (OH)	Y:	-0.2267	-0.00339	+10.1315	+0.02112	+0.001169	+0.1020
				5.470111	4.0782	2.9439	3.8123

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES					
		DU SATELLITE 2 DE SATURNE: ENCELADE					
		N=4.586					
		AO	A1	B0 FO	B1 F1	B2 F2	CO PO
JAN. 1 (OH)	X:	-0.1627	+0.00047	+30.4767	+0.07006	+0.000335	+0.0703
(2446431.5)				1.628575	0.4612	2.4589	0.9365
A JAN. 17 (OH)	Y:	+0.0596	+0.00042	+13.1362	+0.02932	+0.000126	+0.0304
				3.295348	2.3854	4.0864	2.6054
JAN. 17 (OH)	X:	-0.1567	+0.00049	+30.9897	+0.06676	+0.000372	+0.0718
(2446447.5)				5.858338	4.8899	0.5689	3.0511
A FEV. 2 (OH)	Y:	+0.0665	+0.00033	+13.4514	+0.02867	+0.000137	+0.0312
				1.247278	0.4887	2.2124	4.7258
FEV. 1 (OH)	X:	-0.1507	+0.00067	+31.6117	+0.06344	+0.000395	+0.0735
(2446462.5)				5.509367	4.7464	0.3052	2.2920
A FEV. 17 (OH)	Y:	+0.0721	+0.00037	+13.7833	+0.02816	+0.000161	+0.0321
				0.902641	0.2928	2.1689	3.9700
FEV. 17 (OH)	X:	-0.1400	+0.00056	+32.3974	+0.06105	+0.000419	+0.0756
(2446478.5)				3.468277	2.9454	4.8084	4.4219
A MAR. 5 (OH)	Y:	+0.0786	+0.00039	+14.1664	+0.02699	+0.000173	+0.0330
				5.148169	4.7168	0.3782	6.1022
MAR. 1 (OH)	X:	-0.1339	+0.00095	+33.0456	+0.05992	+0.000499	+0.0772
(2446490.5)				1.942373	1.5956	3.5299	1.3113
A MAR. 17 (OH)	Y:	+0.0831	+0.00042	+14.4631	+0.02567	+0.000162	+0.0338
				3.623816	3.3515	5.3449	2.9946
MAR. 17 (OH)	X:	-0.1198	+0.00104	+33.9456	+0.05733	+0.000513	+0.0794
(2446506.5)				6.197511	6.1179	1.7838	3.4551
A AVR. 2 (OH)	Y:	+0.0902	+0.00031	+14.8520	+0.02366	+0.000174	+0.0347
				1.596893	1.5433	3.7004	5.1387
AVR. 1 (OH)	X:	-0.1048	+0.00136	+34.7675	+0.05467	+0.000511	+0.0814
(2446521.5)				5.873617	6.0624	1.8343	2.7210
A AVR. 17 (OH)	Y:	+0.0956	+0.00026	+15.1863	+0.02095	+0.000206	+0.0355
				1.272840	1.4380	3.6734	4.4049
AVR. 17 (OH)	X:	-0.0825	+0.00140	+35.5444	+0.05030	+0.000555	+0.0832
(2446537.5)				3.858875	4.3393	0.2220	4.8757
A MAI 3 (OH)	Y:	+0.1003	+0.00021	+15.4779	+0.01716	+0.000231	+0.0362
				5.539648	6.0082	2.0090	0.2736
MAI 1 (OH)	X:	-0.0631	+0.00178	+36.0767	+0.04432	+0.000550	+0.0844
(2446551.5)				5.241463	6.0263	1.9215	1.2663
A MAI 17 (OH)	Y:	+0.1030	+0.00013	+15.6497	+0.01390	+0.000277	+0.0364
				0.636658	1.4568	3.6808	2.9429
MAI 17 (OH)	X:	-0.0358	+0.00180	+36.4431	+0.03720	+0.000604	+0.0849
(2446567.5)				3.233633	4.4358	0.2949	3.4230
A JUN. 2 (OH)	Y:	+0.1054	-0.00008	+15.7319	+0.01077	+0.000278	+0.0365
				4.908404	0.1018	1.9247	5.0968
JUN. 1 (OH)	X:	-0.0097	+0.00188	+36.5153	+0.03157	+0.000632	+0.0848
(2446582.5)				2.922125	4.6526	0.2392	2.6936
A JUN. 17 (OH)	Y:	+0.1047	-0.00018	+15.6864	+0.01166	+0.000271	+0.0362
				4.592951	0.5106	1.9303	4.3628
JUN. 17 (OH)	X:	+0.0205	+0.00153	+36.2937	+0.03229	+0.000624	+0.0838
(2446598.5)				0.911633	3.3185	4.8137	4.8403
A JUL. 3 (OH)	Y:	+0.1022	-0.00028	+15.5159	+0.01515	+0.000245	+0.0357
				2.578357	5.3363	0.2303	0.2229

ÉPHÉMÉRIDES DES SATELLITES NATURELS

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES					
		DU SATELLITE 2 DE SATURNE: ENCELADE					
		N=4.586					
		AO	A1	B0 FO	B1 F1	B2 F2	CO PO
JUL. 1 (OH)	X:	+0.0424	+0.00158	+35.8685	+0.03793	+0.000645	+0.0825
(2446612.5)				2.289868	5.1814	0.0596	1.2165
A JUL.17 (OH)	Y:	+0.0978	-0.00027	+15.2870	+0.01918	+0.000204	+0.0351
				3.953445	0.7582	2.0236	2.8766
JUL.17 (OH)	X:	+0.0661	+0.00135	+35.1801	+0.04861	+0.000569	+0.0806
(2446628.5)				0.268212	3.5644	4.5400	3.3472
A ADU. 2 (OH)	Y:	+0.0933	-0.00044	+14.9627	+0.02240	+0.000194	+0.0343
				1.929024	5.2911	0.3596	5.0065
ADU. 1 (OH)	X:	+0.0848	+0.00122	+34.4051	+0.05881	+0.000529	+0.0786
(2446643.5)				6.219697	3.4804	4.4477	2.5882
A ADU.17 (OH)	Y:	+0.0872	-0.00042	+14.6354	+0.02484	+0.000167	+0.0334
				1.596028	5.1928	0.3479	4.2464
ADU.17 (OH)	X:	+0.1041	+0.00072	+33.5160	+0.06829	+0.000420	+0.0764
(2446659.5)				4.182591	1.6579	2.6001	4.7015
A SEP. 2 (OH)	Y:	+0.0809	-0.00043	+14.2939	+0.02668	+0.000155	+0.0326
				5.841938	3.3724	4.8562	0.0769
SEP. 1 (OH)	X:	+0.1161	+0.00068	+32.6893	+0.07543	+0.000368	+0.0743
(2446674.5)				3.836534	1.4618	2.5949	3.9266
A SEP.17 (OH)	Y:	+0.0751	-0.00045	+14.0025	+0.02802	+0.000125	+0.0320
				5.497108	3.2236	4.7005	5.5869
SEP.17 (OH)	X:	+0.1286	+0.00044	+31.8642	+0.07994	+0.000316	+0.0724
(2446690.5)				1.785225	5.8411	0.7852	6.0258
A OCT. 3 (OH)	Y:	+0.0679	-0.00030	+13.7407	+0.02922	+0.000117	+0.0314
				3.448318	1.3509	2.8815	1.4071
OCT. 1 (OH)	X:	+0.1340	+0.00067	+31.2307	+0.08399	+0.000247	+0.0710
(2446704.5)				3.127402	1.0229	2.7217	2.3607
A OCT.17 (OH)	Y:	+0.0633	-0.00036	+13.5586	+0.02961	+0.000103	+0.0310
				4.793398	2.8431	4.0774	4.0298
OCT.17 (OH)	X:	+0.1441	+0.00032	+30.6289	+0.08472	+0.000254	+0.0696
(2446720.5)				1.066560	5.3718	0.9171	4.4542
A NOV. 2 (OH)	Y:	+0.0581	-0.00036	+13.4106	+0.03037	+0.000086	+0.0306
				2.737090	0.9364	2.1969	6.1273
NOV. 1 (OH)	X:	+0.1497	+0.00042	+30.2026	+0.08434	+0.000220	+0.0688
(2446735.5)				0.702622	5.1358	0.8769	3.6663
A NOV.17 (OH)	Y:	+0.0533	-0.00038	+13.3314	+0.03073	+0.000095	+0.0305
				2.377978	0.6958	2.0478	5.3451
NOV.17 (OH)	X:	+0.1579	+0.00027	+29.9143	+0.08287	+0.000247	+0.0682
(2446751.5)				4.920568	3.1986	5.3319	5.7587
A DEC. 3 (OH)	Y:	+0.0473	-0.00025	+13.3084	+0.03091	+0.000085	+0.0304
				0.318468	5.0497	0.2602	1.1607
DEC. 1 (OH)	X:	+0.1611	+0.00060	+29.8038	+0.07930	+0.000233	+0.0681
(2446765.5)				6.254810	4.6543	0.2524	2.0947
A DEC.17 (OH)	Y:	+0.0434	-0.00032	+13.3407	+0.03110	+0.000112	+0.0305
				1.658207	0.2087	2.0913	3.7840
DEC.17 (OH)	X:	+0.1700	+0.00037	+29.8492	+0.07631	+0.000266	+0.0683
(2446781.5)				4.190691	2.7355	4.6980	4.1935
A DEC.33 (OH)	Y:	+0.0389	-0.00036	+13.4358	+0.03044	+0.000128	+0.0308
				5.883316	4.5634	0.2087	5.8879

1986

COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 3 DE SATURNE: TETHYS

N=3.328

		A0	A1	B0 FO	B1 F1	B2 F2	C0 PO
JAN. 1 (OH) (2446431.5)	X:	+0.0000	+0.00000	+37.7362 2.928197	+0.06321 1.9175	+0.000489 3.6436	+0.0032 2.6640
A JAN. 17 (OH)	Y:	-0.0012	+0.00000	+15.6140 4.591307	+0.02993 3.8733	+0.000148 5.4243	+0.0013 4.3350
JAN. 17 (OH) (2446447.5)	X:	+0.0000	+0.00000	+38.3756 5.890541	+0.06275 5.1502	+0.000529 0.5118	+0.0033 2.3285
A FEV. 2 (OH)	Y:	-0.0012	+0.00000	+16.0027 1.272724	+0.03039 0.7298	+0.000168 2.3368	+0.0014 3.9805
FEV. 1 (OH) (2446462.5)	X:	+0.0000	+0.00000	+39.1476 5.531240	+0.06381 5.0569	+0.000575 0.3456	+0.0034 1.6056
A FEV. 17 (OH)	Y:	-0.0013	+0.00000	+16.4125 0.914921	+0.03070 0.5497	+0.000192 2.2019	+0.0014 3.2657
FEV. 17 (OH) (2446478.5)	X:	+0.0000	+0.00000	+40.1237 2.222231	+0.06648 2.0388	+0.000611 3.5505	+0.0037 1.2858
A MAR. 5 (OH)	Y:	-0.0014	+0.00000	+16.8852 3.889861	+0.03084 3.7331	+0.000214 5.4331	+0.0015 2.9442
MAR. 1 (OH) (2446490.5)	X:	+0.0000	+0.00000	+40.9290 4.457651	+0.06945 4.4881	+0.000642 5.9823	+0.0038 5.7358
A MAR. 17 (OH)	Y:	-0.0014	+0.00000	+17.2514 6.125186	+0.03084 6.1356	+0.000234 1.6041	+0.0016 1.1326
MAR. 17 (OH) (2446506.5)	X:	+0.0000	+0.00000	+42.0464 1.161697	+0.07400 1.4709	+0.000667 2.9933	+0.0039 5.4635
A AVR. 2 (OH)	Y:	-0.0015	+0.00000	+17.7330 2.828119	+0.03044 3.0811	+0.000257 4.9027	+0.0017 0.8387
AVR. 1 (OH) (2446521.5)	X:	+0.0000	+0.00000	+43.0668 0.827418	+0.07798 1.3879	+0.000699 2.9841	+0.0040 4.7920
A AVR. 17 (OH)	Y:	-0.0016	+0.00000	+18.1475 2.491720	+0.02964 2.9936	+0.000288 4.8769	+0.0017 0.1706
AVR. 17 (OH) (2446537.5)	X:	+0.0000	+0.00000	+44.0309 3.828364	+0.08061 4.6558	+0.000727 0.0809	+0.0044 4.5278
A MAI 3 (OH)	Y:	-0.0017	+0.00000	+18.5111 5.489264	+0.02821 0.0118	+0.000314 1.9170	+0.0018 6.1696
MAI 1 (OH) (2446551.5)	X:	+0.0000	+0.00000	+44.6866 0.175276	+0.08101 1.2389	+0.000772 3.0502	+0.0044 3.4650
A MAI 17 (OH)	Y:	-0.0017	+0.00000	+18.7312 1.832348	+0.02686 2.9415	+0.000333 4.8143	+0.0019 5.1468
MAI 17 (OH) (2446567.5)	X:	+0.0000	+0.00000	+45.1404 3.184012	+0.07875 4.5362	+0.000813 0.1443	+0.0045 3.2590
A JUN. 2 (OH)	Y:	-0.0018	+0.00000	+18.8426 4.835960	+0.02574 0.0509	+0.000329 1.8418	+0.0019 4.8821
JUN. 1 (OH) (2446582.5)	X:	+0.0000	+0.00000	+45.2292 2.863595	+0.07500 4.5108	+0.000845 0.1413	+0.0044 2.6080
A JUN. 17 (OH)	Y:	-0.0018	+0.00000	+18.8014 4.510359	+0.02559 0.0984	+0.000309 1.8203	+0.0018 4.2312
JUN. 17 (OH) (2446598.5)	X:	+0.0000	+0.00000	+44.9547 5.870742	+0.07048 1.5844	+0.000833 3.4507	+0.0045 2.3012
A JUL. 3 (OH)	Y:	-0.0017	+0.00000	+18.6130 1.228820	+0.02592 3.4702	+0.000274 5.1745	+0.0018 3.9713

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES					
		DU SATELLITE 3 DE SATURNE: TETHYS					N=3.328
		AO	A1	B0 FO	B1 F1	B2 F2	CO PO
JUL. 1 (OH) (2446612.5)	X:	+0.0000	+0.00000	+44.4319 2.215054	+0.06786 4.5366	+0.000803 0.0403	+0.0042 1.2732
A JUL. 17 (OH)	Y:	-0.0017	+0.00000	+18.3522 3.851909	+0.02619 0.0970	+0.000250 1.8674	+0.0018 2.9086
JUL. 17 (OH) (2446628.5)	X:	+0.0000	+0.00000	+43.5803 5.211908	+0.06704 1.6224	+0.000725 3.2985	+0.0041 1.0019
A AOU. 2 (OH)	Y:	-0.0016	+0.00000	+17.9854 0.561395	+0.02571 3.3892	+0.000230 5.2367	+0.0017 2.6288
AOU. 1 (OH) (2446643.5)	X:	+0.0000	+0.00000	+42.6207 4.873050	+0.06842 1.6037	+0.000647 3.2035	+0.0039 0.3264
A AOU. 17 (OH)	Y:	-0.0015	+0.00000	+17.6170 0.219738	+0.02474 3.3179	+0.000224 5.2064	+0.0016 1.9316
AOU. 17 (OH) (2446659.5)	X:	+0.0000	+0.00000	+41.5195 1.571789	+0.07077 4.8838	+0.000557 0.1528	+0.0037 6.2487
A SEP. 2 (OH)	Y:	-0.0015	+0.00000	+17.2375 3.200069	+0.02343 0.3111	+0.000212 2.1500	+0.0015 1.6001
SEP. 1 (OH) (2446674.5)	X:	+0.0000	+0.00000	+40.4937 1.218816	+0.07313 4.7712	+0.000485 0.0536	+0.0035 5.5378
A SEP. 17 (OH)	Y:	-0.0014	+0.00000	+16.9216 2.846955	+0.02259 0.2435	+0.000201 1.9853	+0.0015 0.8951
SEP. 17 (OH) (2446690.5)	X:	+0.0000	+0.00000	+39.4746 4.186629	+0.07474 1.6798	+0.000420 3.2809	+0.0033 5.1937
A OCT. 3 (OH)	Y:	-0.0013	+0.00000	+16.6464 5.816011	+0.02237 3.5129	+0.000183 5.1143	+0.0014 0.5320
OCT. 1 (OH) (2446704.5)	X:	+0.0000	+0.00000	+38.6889 0.495440	+0.07549 4.4482	+0.000385 6.1233	+0.0032 4.0926
A OCT. 17 (OH)	Y:	-0.0013	+0.00000	+16.4663 2.126985	+0.02283 0.0677	+0.000167 1.5704	+0.0014 5.7287
OCT. 17 (OH) (2446720.5)	X:	+0.0000	+0.00000	+37.9469 3.453309	+0.07515 1.3110	+0.000360 3.0540	+0.0031 3.7014
A NOV. 2 (OH)	Y:	-0.0012	+0.00000	+16.3347 5.088387	+0.02378 3.2751	+0.000149 4.7052	+0.0013 5.3514
NOV. 1 (OH) (2446735.5)	X:	+0.0000	+0.00000	+37.4247 3.081657	+0.07412 1.1106	+0.000357 2.9326	+0.0030 2.9608
A NOV. 17 (OH)	Y:	-0.0012	+0.00000	+16.2841 4.720879	+0.02485 3.1096	+0.000137 4.5434	+0.0013 4.6049
NOV. 17 (OH) (2446751.5)	X:	+0.0000	+0.00000	+37.0697 6.034354	+0.07211 4.2469	+0.000366 6.1020	+0.0030 2.5979
A DEC. 3 (OH)	Y:	-0.0012	+0.00000	+16.3075 1.395481	+0.02581 6.2601	+0.000133 1.4409	+0.0013 4.2307
DEC. 1 (OH) (2446765.5)	X:	+0.0000	+0.00000	+36.9373 2.334312	+0.07006 0.7149	+0.000388 2.5947	+0.0030 1.4666
A DEC. 17 (OH)	Y:	-0.0012	+0.00000	+16.3922 3.983469	+0.02653 2.7266	+0.000136 4.2584	+0.0013 3.1141
DEC. 17 (OH) (2446781.5)	X:	+0.0000	+0.00000	+36.9949 5.287266	+0.06734 3.8733	+0.000419 5.7221	+0.0030 1.0850
A DEC. 33 (OH)	Y:	-0.0012	+0.00000	+16.5615 0.659012	+0.02706 5.8703	+0.000150 1.1501	+0.0013 2.7595

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES					
		DU SATELLITE 4 DE SATURNE: DIONE				N=2.296	
		AO	A1	BO FO	B1 F1	B2 F2	CO PO
JAN. 1 (OH)	X:	-0.0931	-0.00004	+48.3236	+0.10824	+0.000555	+0.0510
(2446431.5)				5.095127	3.9286	5.7783	3.2075
A JAN. 17 (OH)	Y:	-0.0547	-0.00007	+20.8137	+0.04582	+0.000162	+0.0221
				0.478574	5.8775	1.2675	4.8743
JAN. 17 (OH)	X:	-0.0937	-0.00013	+49.1380	+0.10476	+0.000607	+0.0520
(2446447.5)				4.101431	3.1280	4.9828	1.2248
A FEV. 2 (OH)	Y:	-0.0561	-0.00007	+21.3143	+0.04556	+0.000186	+0.0226
				5.773424	5.0263	0.5255	2.9018
FEV. 1 (OH)	X:	-0.0956	-0.00020	+50.1219	+0.10146	+0.000660	+0.0529
(2446462.5)				0.818499	0.0424	1.9064	0.9457
A FEV. 17 (OH)	Y:	-0.0572	-0.00007	+21.8410	+0.04486	+0.000217	+0.0231
				2.494694	1.8899	3.8015	2.6223
FEV. 17 (OH)	X:	-0.0989	-0.00026	+51.3677	+0.09765	+0.000724	+0.0542
(2446478.5)				6.119366	5.5732	1.1638	5.2582
A MAR. 5 (OH)	Y:	-0.0584	-0.00006	+22.4484	+0.04311	+0.000251	+0.0237
				1.515807	1.0806	3.0807	0.6583
MAR. 1 (OH)	X:	-0.1021	-0.00033	+52.3960	+0.09464	+0.000766	+0.0552
(2446490.5)				2.245747	1.8870	3.7633	3.7867
A MAR. 17 (OH)	Y:	-0.0592	-0.00003	+22.9183	+0.04128	+0.000277	+0.0242
				3.927109	3.6355	5.7101	5.4696
MAR. 17 (OH)	X:	-0.1074	-0.00042	+53.8233	+0.09044	+0.000808	+0.0568
(2446506.5)				1.276393	1.1892	3.1034	1.8293
A AVR. 2 (OH)	Y:	-0.0599	+0.00000	+23.5353	+0.03783	+0.000317	+0.0248
				2.958871	2.8833	5.0514	3.5129
AVR. 1 (OH)	X:	-0.1139	-0.00043	+55.1276	+0.08582	+0.000863	+0.0579
(2446521.5)				4.301507	4.4872	0.1465	1.5721
A AVR. 17 (OH)	Y:	-0.0600	+0.00005	+24.0652	+0.03356	+0.000364	+0.0253
				5.983725	6.1492	2.0843	3.2530
AVR. 17 (OH)	X:	-0.1213	-0.00047	+56.3600	+0.07993	+0.000899	+0.0593
(2446537.5)				3.346187	3.8558	5.8465	5.9075
A MAI 3 (OH)	Y:	-0.0594	+0.00010	+24.5269	+0.02806	+0.000401	+0.0257
				5.026792	5.5267	1.4351	1.3061
MAI 1 (OH)	X:	-0.1281	-0.00043	+57.1988	+0.07401	+0.000953	+0.0599
(2446551.5)				4.085624	4.9079	0.6315	1.0676
A MAI 17 (OH)	Y:	-0.0581	+0.00013	+24.8018	+0.02360	+0.000426	+0.0260
				5.763814	0.3807	2.4291	2.7429
MAI 17 (OH)	X:	-0.1355	-0.00036	+57.7794	+0.06696	+0.000991	+0.0607
(2446567.5)				3.138774	4.3759	0.0544	5.4074
A JUN. 2 (OH)	Y:	-0.0559	+0.00018	+24.9313	+0.02113	+0.000421	+0.0261
				4.813356	0.0366	1.7696	0.8003
JUN. 1 (OH)	X:	-0.1412	-0.00031	+57.8934	+0.06240	+0.001024	+0.0606
(2446582.5)				6.178993	1.5820	3.4078	5.1622
A JUN. 17 (OH)	Y:	-0.0533	+0.00020	+24.8596	+0.02298	+0.000390	+0.0260
				1.566567	3.6471	5.0951	0.5441
JUN. 17 (OH)	X:	-0.1460	-0.00019	+57.5424	+0.06256	+0.001000	+0.0604
(2446598.5)				5.231426	1.1556	2.7724	3.2140
A JUL. 3 (OH)	Y:	-0.0500	+0.00021	+24.5901	+0.02745	+0.000340	+0.0258
				0.614938	3.1588	4.4982	4.8821

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES					
		DU SATELLITE 4 DE SATURNE: DIONE				N=2.296	
		AO	A1	BO FO	B1 F1	B2 F2	CO PO
JUL. 1 (OH) (2446612.5)	X:	-0.1487	-0.00008	+56.8736 5.969702	+0.06792 2.3158	+0.000959 3.7618	+0.0597 4.6537
A JUL.17 (OH)	Y:	-0.0470	+0.00021	+24.2243 1.350075	+0.03133 4.1931	+0.000304 5.5916	+0.0254 0.0294
JUL.17 (OH) (2446628.5)	X:	-0.1499	+0.00000	+55.7832 5.012583	+0.07786 1.7585	+0.000866 3.0779	+0.0588 2.6958
A AOU. 2 (OH)	Y:	-0.0437	+0.00019	+23.7111 0.390240	+0.03431 3.5152	+0.000281 5.0271	+0.0250 4.3590
AOU. 1 (OH) (2446643.5)	X:	-0.1497	+0.00011	+54.5540 1.752537	+0.08822 5.0748	+0.000777 0.0521	+0.0576 2.4314
A AOU.17 (OH)	Y:	-0.0409	+0.00016	+23.1919 3.411964	+0.03586 0.4960	+0.000271 2.0769	+0.0245 4.0883
AOU.17 (OH) (2446659.5)	X:	-0.1480	+0.00015	+53.1431 0.780951	+0.09850 4.3569	+0.000658 5.6219	+0.0563 0.4608
A SEP. 2 (OH)	Y:	-0.0383	+0.00012	+22.6503 2.440211	+0.03671 6.0571	+0.000259 1.3490	+0.0241 2.1213
SEP. 1 (OH) (2446674.5)	X:	-0.1456	+0.00016	+51.8283 3.790184	+0.10623 1.2771	+0.000590 2.5878	+0.0551 0.1821
A SEP.17 (OH)	Y:	-0.0364	+0.00009	+22.1898 5.450592	+0.03749 3.0087	+0.000251 4.5456	+0.0237 1.8409
SEP.17 (OH) (2446690.5)	X:	-0.1429	+0.00020	+50.5207 2.804514	+0.11229 0.4763	+0.000503 1.8475	+0.0539 4.4817
A OCT. 3 (OH)	Y:	-0.0349	+0.00006	+21.7748 4.467422	+0.03851 2.2540	+0.000225 3.6865	+0.0233 6.1478
OCT. 1 (OH) (2446704.5)	X:	-0.1401	+0.00017	+49.5127 3.507887	+0.11593 1.3235	+0.000462 2.7820	+0.0529 5.8875
A OCT.17 (OH)	Y:	-0.0340	+0.00003	+21.4879 5.173954	+0.03986 3.1410	+0.000205 4.5342	+0.0231 1.2707
OCT.17 (OH) (2446720.5)	X:	-0.1374	+0.00017	+48.5590 2.511936	+0.11822 0.4846	+0.000413 2.0371	+0.0521 3.8967
A NOV. 2 (OH)	Y:	-0.0335	+0.00001	+21.2540 4.182507	+0.04144 2.3334	+0.000178 3.6675	+0.0229 5.5703
NOV. 1 (OH) (2446735.5)	X:	-0.1350	+0.00015	+47.8883 5.501890	+0.11917 3.6125	+0.000412 5.2908	+0.0515 3.6012
A NOV.17 (OH)	Y:	-0.0333	+0.00000	+21.1272 0.894171	+0.04304 5.4793	+0.000160 0.6102	+0.0228 5.2774
NOV.17 (OH) (2446751.5)	X:	-0.1327	+0.00007	+47.4299 4.500116	+0.11853 2.7584	+0.000416 4.5044	+0.0511 1.6056
A DEC. 3 (OH)	Y:	-0.0335	-0.00001	+21.0906 6.181293	+0.04415 4.6286	+0.000151 6.0834	+0.0228 3.2922
DEC. 1 (OH) (2446765.5)	X:	-0.1316	+0.00006	+47.2575 5.193587	+0.11728 3.5824	+0.000438 5.3962	+0.0509 3.0053
A DEC.17 (OH)	Y:	-0.0338	-0.00002	+21.1405 0.596799	+0.04491 5.4496	+0.000150 0.7673	+0.0229 4.6930
DEC.17 (OH) (2446781.5)	X:	-0.1306	-0.00002	+47.3279 4.191317	+0.11473 2.7359	+0.000466 4.5773	+0.0512 1.0125
A DEC.33 (OH)	Y:	-0.0344	-0.00003	+21.2906 5.883746	+0.04502 4.5905	+0.000163 6.2593	+0.0230 2.7091

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES					
		DU SATELLITE 5 DE SATURNE:				RHEA	N=1.391
		AO	A1	B0 FO	B1 F1	B2 F2	CO PO
JAN. 1 (OH)	X:	-0.1220	-0.00010	+67.5021 5.570581	+0.14591 4.4206	+0.000759 6.2113	+0.0416 3.0468
(2446431.5)							
A JAN. 17 (OH)	Y:	-0.0008	-0.00007	+28.9752 0.942061	+0.06230 0.0938	+0.000213 1.6572	+0.0179 4.7041
JAN. 17 (OH)	X:	-0.1237	-0.00014	+68.6404 2.664498	+0.14258 1.7113	+0.000825 3.5320	+0.0421 3.5389
(2446447.5)							
A FEV. 2 (OH)	Y:	-0.0021	-0.00006	+29.6836 4.324541	+0.06270 3.6103	+0.000248 5.3661	+0.0182 5.2008
FEV. 1 (OH)	X:	-0.1262	-0.00016	+70.0170 4.657066	+0.13893 3.9011	+0.000919 5.7300	+0.0428 1.2606
(2446462.5)							
A FEV. 17 (OH)	Y:	-0.0032	-0.00005	+30.4277 0.038135	+0.06190 5.7450	+0.000295 1.3219	+0.0186 2.9266
FEV. 17 (OH)	X:	-0.1289	-0.00020	+71.7575 1.761973	+0.13459 1.2385	+0.001013 3.0866	+0.0439 1.7628
(2446478.5)							
A MAR. 5 (OH)	Y:	-0.0041	-0.00002	+31.2820 3.429657	+0.05992 3.0217	+0.000349 5.0069	+0.0192 3.4322
MAR. 1 (OH)	X:	-0.1314	-0.00023	+73.1945 5.878503	+0.13098 5.5440	+0.001089 1.1070	+0.0447 3.7221
(2446490.5)							
A MAR. 17 (OH)	Y:	-0.0045	-0.00002	+31.9423 1.264749	+0.05749 0.9975	+0.000399 3.0485	+0.0195 5.3921
MAR. 17 (OH)	X:	-0.1351	-0.00019	+75.1883 2.996306	+0.12600 2.9398	+0.001156 4.8144	+0.0460 4.2348
(2446506.5)							
A AVR. 2 (OH)	Y:	-0.0050	+0.00000	+32.8072 4.666833	+0.05283 4.6220	+0.000457 0.4701	+0.0200 5.9059
AVR. 1 (OH)	X:	-0.1382	-0.00020	+77.0105 5.013631	+0.12076 5.2375	+0.001243 0.8398	+0.0469 1.9820
(2446521.5)							
A AVR. 17 (OH)	Y:	-0.0049	+0.00002	+33.5475 0.400693	+0.04724 0.6065	+0.000524 2.7692	+0.0204 3.6513
AVR. 17 (OH)	X:	-0.1416	-0.00011	+78.7310 2.145768	+0.11477 2.7015	+0.001296 4.6183	+0.0484 2.5173
(2446537.5)							
A MAI 3 (OH)	Y:	-0.0047	+0.00004	+34.1911 3.814376	+0.04035 4.3691	+0.000579 0.1920	+0.0210 4.1846
MAI 1 (OH)	X:	-0.1439	-0.00007	+79.9018 2.782766	+0.10919 3.6522	+0.001365 5.5795	+0.0493 3.7741
(2446551.5)							
A MAI 17 (OH)	Y:	-0.0039	+0.00005	+34.5726 4.448924	+0.03531 5.4094	+0.000605 1.0730	+0.0213 5.4394
MAI 17 (OH)	X:	-0.1449	-0.00001	+80.7120 6.207174	+0.10248 1.1900	+0.001407 3.0726	+0.0495 4.3180
(2446567.5)							
A JUN. 2 (OH)	Y:	-0.0031	+0.00009	+34.7492 1.586491	+0.03343 3.1092	+0.000588 4.7816	+0.0213 5.9775
JUN. 1 (OH)	X:	-0.1457	+0.00008	+80.8706 1.957500	+0.09883 3.6310	+0.001426 5.4414	+0.0499 2.0856
(2446582.5)							
A JUN. 17 (OH)	Y:	-0.0017	+0.00006	+34.6454 3.616162	+0.03645 5.6393	+0.000538 0.8222	+0.0213 3.7418
JUN. 17 (OH)	X:	-0.1442	+0.00013	+80.3786 5.381955	+0.09841 1.2244	+0.001389 2.8931	+0.0497 2.6230
(2446598.5)							
A JUL. 3 (OH)	Y:	-0.0008	+0.00008	+34.2656 0.753324	+0.04185 3.1890	+0.000462 4.6085	+0.0212 4.2764

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES					
		DU SATELLITE 5 DE SATURNE:				RHEA	N=1.391
		AO	A1	BO FO	B1 F1	B2 F2	CO PO
JUL. 1 (OH)	X:	-0.1427	+0.00021	+79.4440 6.019054	+0.10288 2.2401	+0.001330 3.7933	+0.0490 3.8824
(2446612.5)							
A JUL. 17 (OH)	Y:	+0.0001	+0.00006	+33.7533 1.387255	+0.04599 4.0995	+0.000418 5.6241	+0.0208 5.5320
JUL. 17 (OH)	X:	-0.1395	+0.00020	+77.9205 3.151413	+0.11163 6.0405	+0.001198 1.2103	+0.0480 4.4249
(2446628.5)							
A ADU. 2 (OH)	Y:	+0.0010	+0.00003	+33.0370 4.800085	+0.04834 1.5037	+0.000386 3.1620	+0.0203 6.0726
ADU. 1 (OH)	X:	-0.1364	+0.00024	+76.2029 5.169045	+0.12139 2.0750	+0.001098 3.4780	+0.0470 2.1692
(2446643.5)							
A ADU. 17 (OH)	Y:	+0.0014	+0.00002	+32.3152 0.533118	+0.04878 3.7595	+0.000385 5.5034	+0.0199 3.8163
ADU. 17 (OH)	X:	-0.1327	+0.00021	+74.2325 2.287320	+0.13156 5.7493	+0.000951 0.8607	+0.0454 2.6901
(2446659.5)							
A SEP. 2 (OH)	Y:	+0.0016	+0.00000	+31.5639 3.934451	+0.04810 1.1389	+0.000376 2.8677	+0.0193 4.3379
SEP. 1 (OH)	X:	-0.1294	+0.00021	+72.3955 4.291259	+0.13953 1.6864	+0.000853 3.0949	+0.0441 0.4249
(2446674.5)							
A SEP. 17 (OH)	Y:	+0.0014	-0.00002	+30.9276 5.939590	+0.04767 3.3923	+0.000361 5.0344	+0.0189 2.0735
SEP. 17 (OH)	X:	-0.1260	+0.00016	+70.5708 1.395484	+0.14623 5.2783	+0.000751 0.4476	+0.0428 0.9277
(2446690.5)							
A OCT. 3 (OH)	Y:	+0.0010	-0.00003	+30.3572 3.046391	+0.04822 0.7573	+0.000335 2.2831	+0.0185 2.5808
OCT. 1 (OH)	X:	-0.1235	+0.00014	+69.1628 1.998228	+0.15062 6.0434	+0.000682 1.2753	+0.0417 2.1509
(2446704.5)							
A OCT. 17 (OH)	Y:	+0.0004	-0.00004	+29.9653 3.652363	+0.04966 1.5734	+0.000304 2.9996	+0.0182 3.8077
OCT. 17 (OH)	X:	-0.1212	+0.00013	+67.8326 5.375060	+0.15335 3.3088	+0.000631 4.8525	+0.0407 2.6484
(2446720.5)							
A NOV. 2 (OH)	Y:	-0.0004	-0.00006	+29.6497 0.750615	+0.05192 5.1651	+0.000271 0.2067	+0.0179 4.3099
NOV. 1 (OH)	X:	-0.1192	+0.00007	+66.8951 1.076020	+0.15511 5.4473	+0.000606 0.7963	+0.0399 0.3585
(2446735.5)							
A NOV. 17 (OH)	Y:	-0.0015	-0.00007	+29.4835 2.739746	+0.05452 1.0424	+0.000241 2.3771	+0.0177 2.0252
NOV. 17 (OH)	X:	-0.1178	+0.00005	+66.2562 4.446515	+0.15502 2.6948	+0.000592 4.3574	+0.0393 0.8495
(2446751.5)							
A DEC. 3 (OH)	Y:	-0.0028	-0.00007	+29.4443 6.116055	+0.05681 4.5799	+0.000219 5.9301	+0.0175 2.5218
DEC. 1 (OH)	X:	-0.1172	+0.00003	+66.0163 5.038460	+0.15441 3.4269	+0.000608 5.1546	+0.0389 2.0614
(2446765.5)							
A DEC. 17 (OH)	Y:	-0.0040	-0.00008	+29.5250 0.430117	+0.05848 5.3070	+0.000213 0.4728	+0.0175 3.7395
DEC. 17 (OH)	X:	-0.1167	+0.00000	+66.1157 2.124666	+0.15263 0.6765	+0.000646 2.4614	+0.0387 2.5471
(2446781.5)							
A DEC. 33 (OH)	Y:	-0.0054	-0.00008	+29.7467 3.805619	+0.05969 2.5434	+0.000222 4.1217	+0.0175 4.2310

1986

COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 6 DE SATURNE :

TITAN

N=0.394

		AO	A1	BO FO	B1 F1	CO FO
JAN. 1 (OH) (2446431.5)	X:	-10.7958	+ 0.81590	+154.6766 0.129751	+ 1.00427 5.7279	+2.5982 5.0731
A JAN.12 (OH)	Y:	+ 1.9337	- 0.32347	+ 64.5374 1.778580	+ 0.34891 1.8918	+1.0514 0.5200
JAN.12 (OH) (2446442.5)	X:	- 8.9986	+ 0.50942	+156.4041 4.398853	+ 0.27271 5.5617	+2.3492 0.9161
A JAN.23 (OH)	Y:	+ 2.4675	- 0.44640	+ 68.8782 6.054571	+ 0.25136 2.5106	+1.1002 2.5793
JAN.23 (OH) (2446453.5)	X:	- 5.9370	- 0.01838	+160.4384 2.459345	+ 0.57496 1.3595	+1.9956 3.4286
A FEV. 3 (OH)	Y:	+ 2.5546	- 0.50503	+ 70.8615 4.163758	+ 0.52872 2.8068	+0.7634 5.1094
FEV. 1 (OH) (2446462.5)	X:	-12.8787	+ 1.01278	+159.1447 6.019108	+ 1.19110 5.5028	+2.7413 4.3337
A FEV.12 (OH)	Y:	- 0.6815	+ 0.14821	+ 70.3385 1.395074	+ 0.28349 0.4448	+1.1436 5.9453
FEV.12 (OH) (2446473.5)	X:	-13.6076	+ 1.17298	+160.7413 3.983366	+ 0.91075 5.3822	+2.4769 0.1015
A FEV.23 (OH)	Y:	+ 0.4494	- 0.05669	+ 71.2857 5.693919	+ 0.11484 0.2040	+1.0598 1.8783
FEV.23 (OH) (2446484.5)	X:	-12.3292	+ 1.01434	+173.8286 2.060258	+ 0.76337 6.1808	+1.9835 2.8186
A MAR. 6 (OH)	Y:	+ 1.6500	- 0.29831	+ 73.7883 3.774263	+ 0.33187 2.5896	+0.8718 4.3933
MAR. 1 (OH) (2446490.5)	X:	- 8.7415	+ 0.39999	+168.5957 4.409607	+ 0.39838 5.6193	+2.5778 1.0082
A MAR.12 (OH)	Y:	+ 2.6525	- 0.51101	+ 74.7298 6.071814	+ 0.32973 2.3342	+1.2077 2.6636
MAR.12 (OH) (2446501.5)	X:	- 5.2331	- 0.24344	+171.8839 2.484770	+ 0.58553 1.9927	+2.1765 3.4920
A MAR.23 (OH)	Y:	+ 2.3853	- 0.50803	+ 76.6751 4.191348	+ 0.46117 2.9107	+0.8411 5.2115
MAR.23 (OH) (2446512.5)	X:	- 3.3446	- 0.61782	+173.4309 0.499820	+ 0.70489 1.6756	+2.5840 6.0698
A AVR. 3 (OH)	Y:	+ 1.8833	- 0.43161	+ 73.5816 2.217828	+ 0.48953 2.6712	+1.2175 1.4723
AVR. 1 (OH) (2446521.5)	X:	-14.5489	+ 1.27647	+173.9703 4.033225	+ 1.24038 5.5175	+2.6958 0.2277
A AVR.12 (OH)	Y:	+ 1.0833	- 0.17235	+ 77.5672 5.740726	+ 0.19289 1.2771	+1.1836 2.0065
AVR.12 (OH) (2446532.5)	X:	-12.3671	+ 0.92923	+186.6319 2.124981	+ 0.55020 5.9086	+2.1890 2.9435
A AVR.23 (OH)	Y:	+ 2.0270	- 0.37305	+ 79.5352 3.842902	+ 0.28985 2.5850	+0.9226 4.5234
AVR.23 (OH) (2446543.5)	X:	-10.4303	+ 0.62305	+181.7032 0.206126	+ 0.76710 0.2178	+3.0066 5.3218
A MAI 4 (OH)	Y:	+ 2.8418	- 0.53203	+ 75.5933 1.879813	+ 0.55283 2.5039	+1.2770 0.8108

ÉPHÉMÉRIDES DES SATELLITES NATURELS

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES				
		DU SATELLITE 6 DE SATURNE :			TITAN	N=0.394
		AO	A1	BO FO	B1 F1	CO FO
MAI 1 (OH) (2446551.5)	X:	- 6.1813	- 0.48955	+183.2130 3.361351	+ 0.65991 3.5871	+2.4147 5.1593
A MAI 12 (OH)	Y:	- 3.3290	+ 0.55680	+ 75.9824 5.038508	+ 0.55816 5.7209	+1.0575 0.4607
MAI 12 (OH) (2446562.5)	X:	- 8.6090	- 0.05244	+187.4983 1.406378	+ 0.47006 3.4002	+2.5334 1.5021
A MAI 23 (OH)	Y:	- 3.2715	+ 0.56609	+ 81.0142 3.056605	+ 0.53726 5.5443	+1.0460 3.2836
MAI 23 (OH) (2446573.5)	X:	-12.0917	+ 0.60175	+185.2063 5.784943	+ 0.50243 5.6584	+3.1136 3.8485
A JUN. 3 (OH)	Y:	- 2.4755	+ 0.46854	+ 81.7076 1.185629	+ 0.31963 5.7896	+1.3897 5.4686
JUN. 1 (OH) (2446582.5)	X:	- 1.4388	- 1.23884	+184.2979 3.075555	+ 0.93267 2.8303	+2.2251 4.4735
A JUN. 12 (OH)	Y:	- 1.2298	+ 0.15091	+ 78.3772 4.720585	+ 0.17548 5.5427	+1.0385 6.1861
JUN. 12 (OH) (2446593.5)	X:	- 2.0950	- 1.16969	+182.3490 1.074323	+ 1.27897 2.8003	+2.7580 0.9311
A JUN. 23 (OH)	Y:	- 2.3633	+ 0.36105	+ 80.1168 2.750784	+ 0.43620 5.2686	+1.0600 2.5727
JUN. 23 (OH) (2446604.5)	X:	- 5.0118	- 0.66437	+189.2046 5.450318	+ 0.71071 2.5923	+3.0793 3.0794
A JUL. 4 (OH)	Y:	- 2.9294	+ 0.50204	+ 80.3123 0.873801	+ 0.38170 5.3206	+1.3653 4.8115
JUL. 1 (OH) (2446612.5)	X:	-10.9149	+ 0.67062	+187.8337 2.326868	+ 0.75341 5.7312	+2.2656 3.2333
A JUL. 12 (OH)	Y:	+ 2.8537	- 0.48162	+ 79.6375 4.031496	+ 0.38391 2.1287	+0.8757 4.8280
JUL. 12 (OH) (2446623.5)	X:	- 7.1588	+ 0.04684	+179.9304 0.388603	+ 0.25998 1.8521	+2.8127 5.6622
A JUL. 23 (OH)	Y:	+ 2.9856	- 0.54242	+ 73.2161 2.068011	+ 0.40574 2.7820	+1.2443 1.1173
JUL. 23 (OH) (2446634.5)	X:	- 4.0804	- 0.49917	+182.8914 4.728076	+ 0.77226 1.7868	+2.8678 1.5868
A AOU. 3 (OH)	Y:	+ 2.3597	- 0.45440	+ 76.1496 0.081969	+ 0.50474 2.7972	+1.1933 3.1701
AOU. 1 (OH) (2446643.5)	X:	-14.7606	+ 1.29727	+184.3976 1.989939	+ 1.36963 5.5580	+2.0398 2.6134
A AOU. 12 (OH)	Y:	+ 0.7390	- 0.05168	+ 75.1698 3.669423	+ 0.23246 0.9452	+0.9334 4.2041
AOU. 12 (OH) (2446654.5)	X:	-12.9189	+ 1.06866	+171.2589 0.082143	+ 0.71680 5.5870	+2.9343 4.9507
A AOU. 23 (OH)	Y:	+ 1.8639	- 0.27720	+ 71.1259 1.718910	+ 0.16195 2.3263	+1.1481 0.3697
AOU. 23 (OH) (2446665.5)	X:	-10.4391	+ 0.69473	+167.8060 4.359865	+ 0.62493 0.2424	+2.4725 0.7918
A SEP. 3 (OH)	Y:	+ 2.4881	- 0.41644	+ 73.0594 6.012585	+ 0.43513 2.5714	+1.1388 2.4678

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES				
		DU SATELLITE 6 DE SATURNE:			TITAN	N=0.394
		A0	A1	B0 FO	B1 F1	C0 FO
SEP. 1 (OH) (2446674.5)	X:	-11.5087	+ 0.64700	+172.3412 1.633840	+ 0.91990 5.2401	+2.0691 1.8644
A SEP. 12 (OH)	Y:	- 2.0243	+ 0.41618	+ 71.8674 3.272081	+ 0.43060 6.1052	+0.9331 3.6216
SEP. 12 (OH) (2446685.5)	X:	-12.6544	+ 0.93982	+161.9995 5.994486	+ 0.72826 5.1232	+2.7352 4.2286
A SEP. 23 (OH)	Y:	- 0.9906	+ 0.23157	+ 70.9810 1.363080	+ 0.29468 5.8735	+1.1513 5.8174
SEP. 23 (OH) (2446696.5)	X:	-12.8596	+ 1.05788	+158.2144 3.965635	+ 0.73606 5.9582	+2.3623 0.0062
A OCT. 4 (OH)	Y:	+ 0.0483	+ 0.03978	+ 68.9272 5.665543	+ 0.03641 1.6782	+0.9774 1.7564
OCT. 1 (OH) (2446704.5)	X:	- 0.6956	- 1.10771	+156.3908 0.820483	+ 0.78367 2.8155	+2.2992 0.4573
A OCT. 12 (OH)	Y:	- 0.2831	- 0.01814	+ 68.5806 2.523140	+ 0.05058 5.1087	+0.9911 2.0345
OCT. 12 (OH) (2446715.5)	X:	- 1.3509	- 1.01577	+164.0947 5.169955	+ 1.18567 2.7327	+2.6625 2.5090
A OCT. 23 (OH)	Y:	- 1.2878	+ 0.15906	+ 69.1857 0.582655	+ 0.27975 5.0024	+1.1039 4.2465
OCT. 23 (OH) (2446726.5)	X:	- 2.1616	- 0.88417	+154.2633 3.238499	+ 0.87261 2.3369	+1.8446 4.8328
A NOV. 3 (OH)	Y:	- 2.1384	+ 0.31461	+ 65.6897 4.890069	+ 0.23425 5.0078	+0.8869 0.1780
NOV. 1 (OH) (2446735.5)	X:	- 4.1380	- 0.32557	+153.2624 0.437098	+ 0.08123 2.7197	+2.2612 5.8886
A NOV. 12 (OH)	Y:	+ 2.0099	- 0.42422	+ 65.2176 2.141883	+ 0.30998 2.3795	+1.0750 1.3144
NOV. 12 (OH) (2446746.5)	X:	- 2.4147	- 0.65092	+158.2933 4.764185	+ 0.86032 2.4963	+2.5072 1.7552
A NOV. 23 (OH)	Y:	+ 1.2830	- 0.32079	+ 68.2121 0.141866	+ 0.25008 3.2457	+1.0580 3.3721
NOV. 23 (OH) (2446757.5)	X:	- 0.6532	- 0.98069	+149.9791 2.829260	+ 1.02319 2.0734	+1.8084 4.0358
A DEC. 4 (OH)	Y:	+ 0.3480	- 0.17824	+ 68.0153 4.496433	+ 0.31093 3.1290	+0.8207 5.8358
DEC. 1 (OH) (2446765.5)	X:	-11.8571	+ 0.92803	+149.8719 5.960787	+ 0.97321 5.2406	+2.5358 4.2957
A DEC. 12 (OH)	Y:	- 0.8339	+ 0.14178	+ 68.0517 1.349068	+ 0.28534 0.0310	+1.0914 5.9155
DEC. 12 (OH) (2446776.5)	X:	-12.1998	+ 1.03893	+149.5869 3.917136	+ 0.57203 5.6540	+2.2602 0.0488
A DEC. 23 (OH)	Y:	+ 0.0951	- 0.03449	+ 67.9368 5.640412	+ 0.01558 4.9935	+0.9886 1.8325
DEC. 23 (OH) (2446787.5)	X:	-11.6883	+ 1.02868	+159.5404 1.981118	+ 1.08700 6.0972	+1.7580 2.7472
A DEC. 34 (OH)	Y:	+ 1.2857	- 0.26504	+ 69.4432 3.706185	+ 0.37187 2.2580	+0.8127 4.3332

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES					N=0.394
DU SATELLITE 7 DE SATURNE: HYPERION							
		AO	A1	BO FO	B1 F1	CO FO	
JAN. 1 (OH)	X:	+46.3903	-11.22442	+162.8404	+10.02515	+2.0741	
(2446431.5)				0.776980	4.6929	2.2680	
A JAN. 9 (OH)	Y:	-16.3371	- 1.84900	+ 70.9762	+ 4.18550	+0.7507	
				2.691168	0.5803	3.4659	
JAN. 9 (OH)	X:	-21.9916	- 5.92110	+145.4355	+14.11064	+1.7448	
(2446439.5)				3.527258	1.9515	3.3253	
A JAN. 17 (OH)	Y:	-25.9417	+ 3.07935	+ 57.5375	+ 4.92826	+0.6100	
				5.072303	3.5048	5.4006	
JAN. 17 (OH)	X:	-27.7414	+ 8.43065	+150.0264	+ 6.82211	+3.6396	
(2446447.5)				5.662382	4.0389	4.0890	
A JAN. 25 (OH)	Y:	+14.4434	- 4.01111	+ 68.4638	+ 2.90337	+1.4785	
				0.879977	5.1611	5.5810	
JAN. 25 (OH)	X:	+ 0.8308	- 5.69316	+169.5488	+13.39342	+1.3475	
(2446455.5)				1.769351	5.9585	4.8289	
A FEV. 2 (OH)	Y:	-31.2740	+ 2.08779	+ 79.5523	+ 6.50027	+0.7500	
				3.394727	1.2472	0.3042	
FEV. 1 (OH)	X:	-51.7924	+ 0.05165	+152.0923	+11.75049	+1.5307	
(2446462.5)				3.797483	2.3025	5.3758	
A FEV. 9 (OH)	Y:	-29.1235	+ 5.43591	+ 49.9555	+ 3.87889	+1.0519	
				5.551482	4.3842	0.5700	
FEV. 9 (OH)	X:	+ 2.1896	+ 3.61368	+173.7537	+ 9.08811	+3.9124	
(2446470.5)				6.130253	4.2757	5.1359	
A FEV. 17 (OH)	Y:	+ 9.0229	- 4.55153	+ 68.3647	+ 2.86260	+1.4472	
				1.420254	5.6944	0.5867	
FEV. 17 (OH)	X:	-15.9777	- 2.91927	+178.2218	+15.99391	+1.8037	
(2446478.5)				2.288835	0.3177	0.1146	
A FEV. 25 (OH)	Y:	-26.2461	+ 1.25338	+ 77.0062	+ 6.81888	+0.7149	
				3.959367	1.9776	1.8191	
FEV. 25 (OH)	X:	-77.2113	+10.92849	+150.2850	+ 6.36198	+3.5940	
(2446486.5)				4.332151	2.7177	1.2888	
A MAR. 5 (OH)	Y:	- 3.2351	+ 1.32410	+ 71.8330	+ 4.28830	+1.4937	
				6.208555	4.6607	3.1950	
MAR. 1 (OH)	X:	-21.1953	+ 7.82868	+165.9302	+ 7.76253	+4.0248	
(2446490.5)				5.706798	4.0075	4.2675	
A MAR. 9 (OH)	Y:	+14.4076	- 4.45456	+ 73.5473	+ 3.09256	+1.5464	
				0.938119	5.1842	5.8132	
MAR. 9 (OH)	X:	- 1.7428	- 5.07860	+184.1036	+15.09493	+1.5270	
(2446498.5)				1.838650	6.0597	5.2198	
A MAR. 17 (OH)	Y:	-32.6789	+ 2.04013	+ 84.4319	+ 7.01651	+0.7922	
				3.473285	1.3594	0.5760	
MAR. 17 (OH)	X:	-81.5760	+ 8.41612	+161.1985	+ 8.18335	+3.3384	
(2446506.5)				3.933273	2.3387	0.3337	
A MAR. 25 (OH)	Y:	-19.3831	+ 4.33913	+ 62.6317	+ 4.24125	+1.0855	
				5.885868	4.6097	1.9002	
MAR. 25 (OH)	X:	+19.3275	+ 0.68158	+191.5530	+10.34472	+3.6394	
(2446514.5)				0.197443	4.5312	6.0785	
A AVR. 2 (OH)	Y:	+ 6.0701	- 5.70884	+ 68.5505	+ 2.49798	+1.4859	
				1.831628	6.0836	1.7347	

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES				
		DU SATELLITE 7 DE SATURNE: HYPERION				
		N=0.394				
		AO	A1	BO FO	B1 F1	CO FO
AVR. 1 (OH)	X:	-15.8440	- 3.13023	+189.4417	+17.12362	+1.9225
(2446521.5)				2.364288	0.4250	0.3659
A AVR. 9 (OH)	Y:	-26.7916	+ 1.00504	+ 82.0217	+ 7.38599	+0.7812
				4.055321	2.1114	2.1307
AVR. 9 (OH)	X:	-76.9495	+11.29913	+162.6190	+ 6.92054	+3.8785
(2446529.5)				4.433222	2.8233	1.5559
A AVR. 17 (OH)	Y:	- 2.2697	+ 1.08548	+ 78.0569	+ 4.53868	+1.6895
				6.280508	4.7038	3.4423
AVR. 17 (OH)	X:	+54.6311	- 9.88682	+201.1875	+12.08061	+2.1706
(2446537.5)				0.523197	4.5128	1.5522
A AVR. 25 (OH)	Y:	- 8.9203	- 4.28522	+ 76.0007	+ 3.65378	+1.2535
				2.418965	0.3635	2.9465
AVR. 25 (OH)	X:	-12.0407	- 7.70104	+168.2592	+16.07462	+2.0636
(2446545.5)				3.250308	1.6425	2.8503
A MAI 3 (OH)	Y:	-29.3018	+ 2.23564	+ 73.8698	+ 6.60563	+0.6288
				4.824601	3.1501	4.5601
MAI 1 (OH)	X:	-71.2697	+11.58378	+166.3098	+ 7.00572	+3.9668
(2446551.5)				4.673176	3.0857	2.0863
A MAI 9 (OH)	Y:	+ 0.7269	+ 0.46930	+ 81.1665	+ 4.57047	+1.8328
				0.189918	4.8599	3.9333
MAI 9 (OH)	X:	+58.1772	-12.69645	+199.3651	+12.51554	+2.4308
(2446559.5)				0.700513	4.6255	2.3020
A MAI 17 (OH)	Y:	-19.1087	- 2.31096	+ 85.0720	+ 5.03449	+0.8666
				2.618015	0.4887	3.5165
MAI 17 (OH)	X:	-17.2054	- 7.92776	+170.8418	+16.29411	+2.0791
(2446567.5)				3.464303	1.9182	3.3814
A MAI 25 (OH)	Y:	-33.0843	+ 3.64195	+ 68.1477	+ 5.64308	+0.7072
				4.998079	3.4419	5.4910
MAI 25 (OH)	X:	-33.2543	+10.03788	+177.0304	+ 7.73139	+4.2561
(2446575.5)				5.607714	3.9688	4.0876
A JUN. 2 (OH)	Y:	+15.1686	- 4.27298	+ 81.1432	+ 3.47376	+1.7187
				0.841020	5.1034	5.5865
JUN. 1 (OH)	X:	+26.8734	- 9.98841	+192.5837	+13.41862	+1.9183
(2446582.5)				1.350302	5.4279	3.6671
A JUN. 9 (OH)	Y:	-34.7307	+ 1.63380	+ 94.5659	+ 7.28611	+0.7608
				3.066223	0.8738	5.7878
JUN. 9 (OH)	X:	-56.0253	- 0.31768	+176.1565	+13.17800	+1.7848
(2446590.5)				3.778554	2.2763	5.4689
A JUN. 17 (OH)	Y:	-34.5541	+ 6.21372	+ 56.7275	+ 4.16504	+1.1668
				5.516395	4.3507	0.6279
JUN. 17 (OH)	X:	+ 0.3641	+ 4.43224	+196.3669	+10.04456	+4.3353
(2446598.5)				6.131729	4.2694	5.1754
A JUN. 25 (OH)	Y:	+ 9.9988	- 4.84968	+ 76.1826	+ 3.16990	+1.5552
				1.408636	5.6481	0.6138
JUN. 25 (OH)	X:	-15.0536	- 3.24061	+197.9613	+17.51376	+1.9246
(2446606.5)				2.301886	0.3267	0.1189
A JUL. 3 (OH)	Y:	-27.2846	+ 1.04819	+ 83.7467	+ 7.35547	+0.7532
				3.971508	1.9885	1.8350

ÉPHÉMÉRIDES DES SATELLITES NATURELS

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES				
		DU SATELLITE 7 DE SATURNE: HYPERION				
		N=0.394				
		A0	A1	B0 FO	B1 F1	C0 FO
JUL. 1 (OH)	X:	-74.1252	+ 4.75812	+172.2687	+10.50697	+2.6356
(2446612.5)				3.865165	2.3104	6.2151
A JUL. 9 (OH)	Y:	-28.2103	+ 5.68695	+ 58.5435	+ 4.15978	+1.0671
				5.735071	4.5461	1.2214
JUL. 9 (OH)	X:	+ 8.4277	+ 2.94455	+194.4243	+10.22093	+4.0027
(2446620.5)				0.059753	4.4399	5.6606
A JUL. 17 (OH)	Y:	+ 8.2415	- 5.14124	+ 71.7221	+ 2.84558	+1.4438
				1.635609	5.8617	1.1918
JUL. 17 (OH)	X:	-14.3527	- 3.76622	+185.7891	+16.66998	+1.7579
(2446628.5)				2.519129	0.6057	0.6729
A JUL. 25 (OH)	Y:	-24.6780	+ 0.69112	+ 80.0374	+ 7.26761	+0.7614
				4.200379	2.2813	2.4377
JUL. 25 (OH)	X:	-72.6070	+11.10916	+158.8984	+ 6.79436	+3.6572
(2446636.5)				4.607502	2.9839	1.8994
A ADU. 2 (OH)	Y:	- 0.5292	+ 0.81029	+ 75.7595	+ 4.34160	+1.6303
				0.122951	4.7858	3.7465
ADU. 1 (OH)	X:	+40.7621	- 5.54071	+194.5256	+11.16053	+2.2326
(2446643.5)				0.434800	4.5236	0.7835
A ADU. 9 (OH)	Y:	- 0.1830	- 5.11826	+ 67.0581	+ 2.70207	+1.3290
				2.222838	0.1889	2.5401
ADU. 9 (OH)	X:	- 9.7401	- 6.68328	+161.1475	+14.92428	+1.6527
(2446651.5)				3.075260	1.3767	2.3295
A ADU. 17 (OH)	Y:	-25.3219	+ 1.35119	+ 71.9173	+ 6.57137	+0.5986
				4.672615	2.9075	3.8137
ADU. 17 (OH)	X:	-56.2474	+12.12841	+147.3234	+ 5.63133	+3.2835
(2446659.5)				5.171859	3.6530	3.1822
A ADU. 25 (OH)	Y:	+ 8.1640	- 1.46150	+ 75.4653	+ 3.81705	+1.7085
				0.540962	5.0391	4.8214
ADU. 25 (OH)	X:	+32.0972	- 9.62264	+172.4496	+11.80113	+1.7833
(2446667.5)				1.235034	5.2788	3.4401
A SEP. 2 (OH)	Y:	-28.9422	+ 0.87878	+ 84.1528	+ 6.34111	+0.5762
				2.981684	0.7959	5.5305
SEP. 1 (OH)	X:	-20.5089	- 6.30072	+153.4572	+14.08129	+1.5091
(2446674.5)				3.554668	2.0156	3.7282
A SEP. 9 (OH)	Y:	-31.4675	+ 4.08565	+ 56.8147	+ 4.38682	+0.6956
				5.081319	3.6047	5.9723
SEP. 9 (OH)	X:	-21.3146	+ 7.89338	+160.2176	+ 7.51142	+3.6624
(2446682.5)				5.722837	3.9919	4.3537
A SEP. 17 (OH)	Y:	+13.2247	- 3.92519	+ 70.5366	+ 3.08106	+1.3855
				0.943803	5.1781	5.8765
SEP. 17 (OH)	X:	+ 2.4850	- 4.54540	+173.1274	+14.22049	+1.3802
(2446690.5)				1.852229	6.0779	5.3358
A SEP. 25 (OH)	Y:	-28.4878	+ 1.44983	+ 77.9882	+ 6.47476	+0.6730
				3.485145	1.3890	0.6701
SEP. 25 (OH)	X:	-72.0801	+ 7.51979	+149.6410	+ 7.64924	+2.9229
(2446698.5)				3.948422	2.2887	0.4885
A OCT. 3 (OH)	Y:	-17.8112	+ 3.90591	+ 58.1955	+ 3.77337	+0.9230
				5.868328	4.5312	2.0938

1986

COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 7 DE SATURNE: HYPERION

N=0.394

		AO	A1	B0 FO	B1 F1	C0 FO
OCT. 1 (OH) (2446704.5)	X:	- 8.1301	+ 5.94099	+161.7765 5.907885	+ 8.09568 4.0954	+3.5403 4.7860
A OCT. 9 (OH)	Y:	+11.1595	- 4.05941	+ 67.7795 1.149725	+ 2.95994 5.3751	+1.2867 0.1287
OCT. 9 (OH) (2446712.5)	X:	- 1.5570	- 3.55213	+167.6214 2.048891	+14.45255 0.0477	+1.4750 5.9692
A OCT. 17 (OH)	Y:	-25.8703	+ 1.05368	+ 74.1146 3.703338	+ 6.35327 1.6826	+0.6158 1.3116
OCT. 17 (OH) (2446720.5)	X:	-69.3973	+ 8.80893	+144.1297 4.104018	+ 6.69794 2.4031	+3.0841 0.9659
A OCT. 25 (OH)	Y:	-10.6882	+ 2.60754	+ 62.8221 6.012023	+ 3.84076 4.5360	+1.1072 2.8161
OCT. 25 (OH) (2446728.5)	X:	+34.8962	- 2.88486	+171.8206 0.303336	+ 9.97166 4.4550	+1.9084 0.4864
A NOV. 2 (OH)	Y:	+ 2.4494	- 4.97924	+ 60.1674 2.035870	+ 2.39065 6.2428	+1.1311 2.3833
NOV. 1 (OH) (2446735.5)	X:	- 1.6692	- 4.40586	+151.1900 2.549443	+13.57353 0.7167	+1.2983 1.1325
A NOV. 9 (OH)	Y:	-22.3764	+ 0.44903	+ 69.7711 4.241543	+ 6.42862 2.3925	+0.6318 2.8255
NOV. 9 (OH) (2446743.5)	X:	-56.2470	+ 9.89590	+137.6424 4.625488	+ 5.77349 2.9587	+3.0080 2.2276
A NOV. 17 (OH)	Y:	- 0.6599	+ 0.69668	+ 68.5646 0.162897	+ 3.87107 4.8159	+1.4523 4.0933
NOV. 17 (OH) (2446751.5)	X:	+50.8371	- 9.22069	+164.8041 0.674059	+10.96268 4.6568	+1.6196 2.5724
A NOV. 25 (OH)	Y:	-16.2397	- 1.78157	+ 72.4202 2.569905	+ 4.64820 0.4448	+0.4938 3.7569
NOV. 25 (OH) (2446759.5)	X:	- 6.5712	- 6.75383	+136.2475 3.374327	+12.37967 1.8690	+1.3796 3.6536
A DEC. 3 (OH)	Y:	-30.8848	+ 3.58678	+ 55.4837 4.891005	+ 4.16807 3.3952	+0.5968 5.9471
DEC. 1 (OH) (2446765.5)	X:	-50.8705	+10.71844	+133.3844 4.819837	+ 5.07037 3.1738	+2.8225 2.7565
A DEC. 9 (OH)	Y:	+ 3.0230	- 0.23325	+ 70.3637 0.315915	+ 3.76800 4.8840	+1.5243 4.5459
DEC. 9 (OH) (2446773.5)	X:	+45.0945	- 8.83399	+160.2971 0.894527	+11.10790 4.9332	+1.5353 3.1689
A DEC. 17 (OH)	Y:	-22.8271	- 0.32864	+ 77.3235 2.744159	+ 5.64450 0.6045	+0.3834 5.0486
DEC. 17 (OH) (2446781.5)	X:	-16.9849	- 4.64134	+140.2949 3.484076	+11.62992 2.0035	+1.1168 4.5920
A DEC. 25 (OH)	Y:	-33.0694	+ 4.78163	+ 51.1408 5.051732	+ 3.35880 3.7488	+0.8427 0.2934
DEC. 25 (OH) (2446789.5)	X:	- 8.9280	+ 7.03366	+150.6096 5.733624	+ 7.30252 3.9564	+3.2006 4.7268
A DEC. 33 (OH)	Y:	+10.4621	- 3.69226	+ 69.2480 1.006890	+ 3.20333 5.2371	+1.2296 0.0485

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES			
		DU SATELLITE 8 DE SATURNE:		JAPET	N=0.079
		AO	A1	BO FO	CO FO
JAN. 1 (OH) (2446431.5)	X:	-13.2500	- 1.65828	+415.8611 2.972456	+ 2.8809 3.4710
A JAN. 17 (OH)	Y:	+ 4.4650	+ 0.05636	+161.9795 5.272090	+ 1.4097 0.4737
JAN. 17 (OH) (2446447.5)	X:	-16.5015	- 1.39552	+446.7758 4.254966	+ 8.4593 0.9983
A FEV. 2 (OH)	Y:	+11.3162	- 0.15381	+165.2013 0.200713	+ 3.2274 2.5343
FEV. 1 (OH) (2446462.5)	X:	+10.4629	- 1.61909	+494.2102 5.354487	+13.8705 2.0458
A FEV. 17 (OH)	Y:	+ 6.3213	- 0.00634	+168.5238 1.383859	+ 3.7665 4.5070
FEV. 17 (OH) (2446478.5)	X:	+14.6655	- 2.68446	+498.9685 0.249871	+ 5.7974 4.0611
A MAR. 5 (OH)	Y:	+ 3.7304	- 0.16419	+167.8810 2.625423	+ 3.2630 0.6875
MAR. 1 (OH) (2446490.5)	X:	-30.1617	+ 1.65562	+494.2652 1.340090	+13.6576 5.8498
A MAR. 17 (OH)	Y:	+12.0983	- 0.91590	+165.5042 3.673548	+ 5.8430 2.0913
MAR. 17 (OH) (2446506.5)	X:	-55.2153	+ 3.02610	+552.6070 2.524820	+ 4.0194 4.0632
A AVR. 2 (OH)	Y:	+19.0798	- 0.79667	+192.3857 4.891216	+ 0.5460 1.4038
AVR. 1 (OH) (2446521.5)	X:	-54.8623	+ 5.42166	+556.7833 3.583853	+15.4124 5.2238
A AVR. 17 (OH)	Y:	+28.5055	- 2.17916	+217.6062 5.968548	+ 6.1962 1.7394
AVR. 17 (OH) (2446537.5)	X:	-25.4917	+ 2.70157	+490.6581 4.942812	+ 1.3235 4.9436
A MAI 3 (OH)	Y:	+20.0840	- 1.97415	+187.9738 0.862479	+ 2.7510 2.2570
MAI 1 (OH) (2446551.5)	X:	-22.6633	+ 0.03139	+527.9974 6.154451	+11.4817 4.2282
A MAI 17 (OH)	Y:	+ 1.2806	+ 0.43037	+197.6609 2.182476	+ 4.4218 6.2786
MAI 17 (OH) (2446567.5)	X:	-50.1900	+ 2.11856	+549.8101 1.214652	+13.1178 6.0257
A JUN. 2 (OH)	Y:	+17.6334	- 0.54783	+191.8813 3.522488	+ 5.7837 2.0641
JUN. 1 (OH) (2446582.5)	X:	-22.7022	+ 0.26891	+532.8930 2.352620	+13.3759 2.4149
A JUN. 17 (OH)	Y:	+ 6.1239	+ 0.94227	+189.4029 4.577174	+ 6.5925 4.9042
JUN. 17 (OH) (2446598.5)	X:	-20.3436	+ 1.72009	+542.5752 3.601771	+13.8444 4.7263
A JUL. 3 (OH)	Y:	+ 9.8003	- 0.22962	+195.8584 5.939640	+ 4.1358 0.6094

1986

COORDONNEES EQUATORIALES DIFFERENTIELLES

		DU SATELLITE 8 DE SATURNE:		JAPET	N=0.079
		A0	A1	BO FO	CO FO
JUL. 1 (OH) (2446612.5)	X:	-12.8160	- 0.82563	+521.7478 4.795460	+ 4.7531 0.5208
A JUL.17 (OH)	Y:	- 9.1076	+ 1.81635	+189.8673 0.960594	+ 3.3508 4.5905
JUL.17 (OH) (2446628.5)	X:	-28.5837	- 0.61993	+519.9320 6.065559	+ 5.6180 3.2306
A AOU. 2 (OH)	Y:	+ 1.7388	+ 1.56808	+211.6389 2.135007	+ 4.7737 5.3095
AOU. 1 (OH) (2446643.5)	X:	-25.7792	+ 0.86899	+495.1145 0.985441	+ 5.6273 6.2435
A AOU.17 (OH)	Y:	- 0.2456	+ 1.35228	+202.8873 3.185672	+ 1.9642 4.4372
AOU.17 (OH) (2446659.5)	X:	-12.7541	+ 0.90036	+491.7702 2.237579	+ 8.6581 2.7545
A SEP. 2 (OH)	Y:	+ 0.5034	+ 0.36353	+173.0589 4.488456	+ 5.1080 4.8454
SEP. 1 (OH) (2446674.5)	X:	+ 7.6611	- 2.59363	+441.2904 3.478029	+ 6.0416 4.2963
A SEP.17 (OH)	Y:	- 8.8456	+ 1.17291	+153.7837 5.738567	+ 3.1930 6.1174
SEP.17 (OH) (2446690.5)	X:	-43.2651	+ 1.21925	+430.7535 4.624141	+ 6.6103 0.0786
A OCT. 3 (OH)	Y:	- 0.7103	+ 1.14546	+163.9652 0.780472	+ 2.6989 3.5864
OCT. 1 (OH) (2446704.5)	X:	-30.6938	+ 0.75558	+435.4300 5.750808	+ 7.0393 2.4993
A OCT.17 (OH)	Y:	+15.0195	- 0.36723	+158.7602 1.735122	+ 1.7931 4.4072
OCT.17 (OH) (2446720.5)	X:	-19.4015	+ 1.71619	+427.2262 0.749971	+ 6.4690 5.0027
A NOV. 2 (OH)	Y:	+16.4342	- 1.25663	+142.0185 3.047829	+ 3.1500 1.8333
NOV. 1 (OH) (2446735.5)	X:	+14.7785	- 2.43944	+397.1601 1.790970	+ 9.5487 1.9321
A NOV.17 (OH)	Y:	+ 4.2522	- 0.54402	+153.8163 4.203843	+ 1.7488 3.7982
NOV.17 (OH) (2446751.5)	X:	-11.1594	- 1.27503	+412.0582 3.099846	+ 5.4182 4.4120
A DEC. 3 (OH)	Y:	+ 2.7036	- 0.36025	+159.7000 5.420923	+ 2.5795 1.0288
DEC. 1 (OH) (2446765.5)	X:	- 6.2896	- 3.23526	+428.0133 4.288298	+10.5036 1.0057
A DEC.17 (OH)	Y:	+ 1.3640	+ 0.76048	+143.5350 0.235749	+ 2.2419 2.6506
DEC.17 (OH) (2446781.5)	X:	- 6.1424	- 0.84916	+449.6411 5.381029	+12.1825 1.9787
A DEC.33 (OH)	Y:	+ 9.2840	+ 0.09941	+150.0935 1.418997	+ 3.1431 4.3602

SATELLITES D'URANUS
SATELLITES OF URANUS

DONNÉES SUR LES SATELLITES D'URANUS

DATA ON THE SATELLITES OF URANUS

NOM	masse	rayon	période rotation sidérale	albédo géométrique	magnitude visuelle	période orbitale	élongation maximale	1/2 grand axe	excentricité	inclinaison sur l'équateur d'Uranus
unité →	masse d'Uranus	km	jour			jour	(")	10 ³ km		degré
I Ariel	1.8×10^{-5}	665		0.2	14.4	2.520 379 35	14	191.02	0.003 4	0.31
II Umbriel	1.2×10^{-5}	555		0.1	15.3	4.144 177 2	20	266.30	0.005 0	0.36
III Titania	6.8×10^{-5}	800		0.21	14.0	8.705 871 7	33	435.91	0.002 2	0.142
IV Oberon	6.9×10^{-5}	815	(S)	0.16	14.2	13.463 238 9	44	583.52	0.000 8	0.101
V Miranda	0.2×10^{-5}	150?			16.5	1.413 479 25	10	129.39	0.002 7	4.22

NAME	mass	radius	sidereal rotation	geometrical albedo	visual magnitude	orbital period	greatest elongation	semi major axis	eccentricity	inclination on Uranus' equator
unit →	Uranus' mass	km	day			day	(")	10 ³ km		degree

NOTES

(S) : rotation synchrone

(S) : synchronous rotation

Données extraites de l'*Encyclopédie du Bureau des Longitudes*.

Data from the *Encyclopédie du Bureau des Longitudes*.

ÉPHÉMÉRIDES DES CINQ SATELLITES D'URANUS

EPHEMERIDES OF THE FIVE SATELLITES OF URANUS

Coordonnées différentielles tangentielles données en secondes de degré dans le repère équatorial moyen 1950.0. *Differential tangential coordinates given in arcsecond in the mean equatorial frame 1950.0.*

$$\begin{aligned}\Delta\alpha \cos\delta &= X \\ \Delta\delta &= Y\end{aligned}$$

$$\left. \begin{matrix} X \\ Y \end{matrix} \right\} = A0 + A1 \cdot t + B0 \sin(Nt + F0) + B1 \cdot t \sin(Nt + F1) + B2 \cdot t^2 \sin(Nt + F2) + C0 \sin(2Nt + P0)$$

où $t = T - T0$ avec $T0$ date du début de l'intervalle et T date du calcul *Where $t = T - T0$ with $T0$ date of the beginning of the interval and T the date for the calculation*

satellite	intervalle Δt (jours)	N (rad/j)	page
Miranda	8	4.488 0	86
Ariel	32	2.493 0	90
Umbriel	32	1.516 2	91
Titania	32	0.721 7	92
Obéron	32	0.466 7	93
	(days)	(rad/d)	

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES					
		DU SATELLITE 5 D'URANUS: MIRANDA					
		N=4.4880					
		AO	A1	B0 FO	B1 F1	B2 F2	CO PO

JANVIER							

JAN. 1 (OH)	X:	-0.0068	-0.00001	+ 8.9052	+0.38646	+0.008020	+0.0112
(2446431.5)				5.708751	4.1414	2.3999	4.5600
A JAN. 9 (OH)	Y:	-0.0344	-0.00001	+ 8.7210	+0.38156	+0.008062	+0.0123
				0.999465	5.7166	3.9589	6.1838

JAN. 9 (OH)	X:	-0.0066	-0.00001	+ 8.9308	+0.38513	+0.008030	+0.0127
(2446439.5)				3.570593	2.0064	0.2970	0.3350
A JAN. 17 (OH)	Y:	-0.0348	+0.00000	+ 8.7450	+0.38054	+0.007965	+0.0111
				5.142719	3.5777	1.8434	1.9030

JAN. 17 (OH)	X:	-0.0069	-0.00004	+ 8.9610	+0.38728	+0.008246	+0.0112
(2446447.5)				1.433433	6.1582	4.4292	2.4046
A JAN. 25 (OH)	Y:	-0.0347	+0.00000	+ 8.7727	+0.38129	+0.008154	+0.0120
				3.003593	1.4450	5.9929	3.8248

JAN. 25 (OH)	X:	-0.0075	-0.00001	+ 9.0025	+0.38909	+0.008023	+0.0116
(2446455.5)				5.579897	4.0182	2.2823	4.2620
A FEV. 2 (OH)	Y:	-0.0348	-0.00002	+ 8.8108	+0.38329	+0.008083	+0.0122
				0.865297	5.5898	3.8424	5.9302

FEVRIER							

FEV. 1 (OH)	X:	-0.0078	-0.00001	+ 9.0417	+0.39069	+0.008013	+0.0125
(2446462.5)				5.281405	3.7205	1.9811	3.6705
A FEV. 9 (OH)	Y:	-0.0350	-0.00002	+ 8.8488	+0.38361	+0.008070	+0.0115
				0.565273	5.2913	3.5567	5.3278

FEV. 9 (OH)	X:	-0.0075	-0.00001	+ 9.0903	+0.39023	+0.008101	+0.0120
(2446470.5)				3.145069	1.5880	6.1653	5.8105
A FEV. 17 (OH)	Y:	-0.0352	+0.00000	+ 8.8972	+0.38400	+0.008138	+0.0121
				4.710889	3.1566	1.4395	0.9670

FEV. 17 (OH)	X:	-0.0079	-0.00005	+ 9.1423	+0.39389	+0.008351	+0.0111
(2446478.5)				1.009778	5.7409	4.0088	1.3961
A FEV. 25 (OH)	Y:	-0.0352	-0.00002	+ 8.9497	+0.38651	+0.008248	+0.0125
				2.574208	1.0228	5.5761	3.0596

FEV. 25 (OH)	X:	-0.0086	-0.00002	+ 9.2042	+0.39649	+0.008132	+0.0130
(2446486.5)				5.157884	3.6013	1.8650	3.4311
A MAR. 5 (OH)	Y:	-0.0356	-0.00002	+ 9.0091	+0.38828	+0.008138	+0.0115
				0.437999	5.1680	3.4434	5.0346

MARS							

MAR. 1 (OH)	X:	-0.0084	-0.00002	+ 9.2333	+0.39594	+0.008302	+0.0122
(2446490.5)				4.090135	2.5377	0.8262	1.2834
A MAR. 9 (OH)	Y:	-0.0359	-0.00002	+ 9.0414	+0.38904	+0.007979	+0.0125
				5.653243	4.0969	2.3780	2.9341

MAR. 9 (OH)	X:	-0.0087	-0.00004	+ 9.2949	+0.39852	+0.008509	+0.0132
(2446498.5)				1.955416	0.4065	4.9741	3.3514
A MAR. 17 (OH)	Y:	-0.0358	+0.00000	+ 9.1004	+0.39086	+0.008289	+0.0110
				3.517704	1.9677	0.2522	4.8824

MAR. 17 (OH)	X:	-0.0092	-0.00003	+ 9.3611	+0.40190	+0.008449	+0.0120
(2446506.5)				6.104284	4.5532	2.8270	5.3828
A MAR. 25 (OH)	Y:	-0.0357	-0.00003	+ 9.1654	+0.39522	+0.008274	+0.0126
				1.383075	6.1142	4.3690	0.5407

MAR. 25 (OH)	X:	-0.0094	-0.00002	+ 9.4276	+0.40320	+0.008470	+0.0128
(2446514.5)				3.969811	2.4181	0.7134	1.0172
A AVR. 2 (OH)	Y:	-0.0364	-0.00001	+ 9.2319	+0.39587	+0.008144	+0.0124
				5.531408	3.9762	2.2569	2.6814

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES					
		DU SATELLITE 5 D'URANUS: MIRANDA					
		N=4.4880					
		AO	A1	BO FO	B1 F1	B2 F2	CO PO

AVRIL							

AVR. 1 (OH) (2446521.5)	X:	-0.0096	-0.00002	+ 9.4851 3.673134	+0.40506 2.1203	+0.008483 0.4233	+0.0134 0.4589
A AVR. 9 (OH)	Y:	-0.0365	-0.00001	+ 9.2867 5.234709	+0.39800 3.6808	+0.008281 1.9595	+0.0118 2.0474

AVR. 9 (OH) (2446529.5)	X:	-0.0100	-0.00005	+ 9.5466 1.539180	+0.40908 6.2720	+0.008746 4.5531	+0.0123 2.5548
A AVR. 17 (OH)	Y:	-0.0365	+0.00000	+ 9.3456 3.100673	+0.40045 1.5502	+0.008547 6.1082	+0.0125 3.9502

AVR. 17 (OH) (2446537.5)	X:	-0.0108	-0.00003	+ 9.6100 5.688338	+0.41237 4.1316	+0.008563 2.4042	+0.0122 4.4199
A AVR. 25 (OH)	Y:	-0.0365	-0.00002	+ 9.4051 0.967098	+0.40408 5.6959	+0.008510 3.9528	+0.0132 6.0584

AVR. 25 (OH) (2446545.5)	X:	-0.0107	-0.00002	+ 9.6656 3.553799	+0.41291 1.9968	+0.008663 0.2974	+0.0137 0.2266
A MAI 3 (OH)	Y:	-0.0369	+0.00000	+ 9.4600 5.116331	+0.40481 3.5591	+0.008485 1.8361	+0.0120 1.7546

MAI							

MAI 1 (OH) (2446551.5)	X:	-0.0114	-0.00003	+ 9.7047 5.095025	+0.41748 3.5340	+0.008636 1.7942	+0.0137 3.2644
A MAI 9 (OH)	Y:	-0.0370	+0.00000	+ 9.4963 0.374490	+0.40633 5.0991	+0.008522 3.3759	+0.0121 4.8262

MAI 9 (OH) (2446559.5)	X:	-0.0113	-0.00002	+ 9.7484 2.960119	+0.41762 1.3994	+0.008784 5.9690	+0.0121 5.3258
A MAI 17 (OH)	Y:	-0.0369	+0.00001	+ 9.5378 4.523791	+0.40739 2.9654	+0.008695 1.2521	+0.0135 0.5477

MAI 17 (OH) (2446567.5)	X:	-0.0117	-0.00006	+ 9.7830 0.825563	+0.42153 5.5483	+0.009032 3.8049	+0.0127 0.9053
A MAI 25 (OH)	Y:	-0.0368	+0.00000	+ 9.5722 2.390107	+0.41047 0.8290	+0.008759 5.3763	+0.0127 2.6383

MAI 25 (OH) (2446575.5)	X:	-0.0125	-0.00003	+ 9.8142 4.973626	+0.42339 3.4050	+0.008817 1.6573	+0.0138 3.0227
A JUN. 2 (OH)	Y:	-0.0371	+0.00000	+ 9.6004 0.255914	+0.41116 4.9719	+0.008612 3.2469	+0.0124 4.5334

JUIN							

JUN. 1 (OH) (2446582.5)	X:	-0.0127	-0.00002	+ 9.8299 4.675761	+0.42423 3.1060	+0.008922 1.3599	+0.0131 2.4436
A JUN. 9 (OH)	Y:	-0.0371	+0.00001	+ 9.6167 6.242260	+0.41191 4.6707	+0.008550 2.9483	+0.0132 3.9197

JUN. 9 (OH) (2446590.5)	X:	-0.0128	-0.00003	+ 9.8375 2.539567	+0.42386 0.9693	+0.009065 5.5198	+0.0127 4.3403
A JUN. 17 (OH)	Y:	-0.0367	+0.00004	+ 9.6222 4.107391	+0.41228 2.5377	+0.008824 0.8187	+0.0130 6.0574

JUN. 17 (OH) (2446598.5)	X:	-0.0132	-0.00004	+ 9.8348 0.403365	+0.42586 5.1142	+0.009164 3.3592	+0.0139 0.1067
A JUN. 25 (OH)	Y:	-0.0364	+0.00000	+ 9.6213 1.972475	+0.41498 0.3977	+0.008791 4.9287	+0.0116 1.6723

JUN. 25 (OH) (2446606.5)	X:	-0.0137	-0.00002	+ 9.8252 4.549577	+0.42553 2.9709	+0.009007 1.2204	+0.0127 2.1492
A JUL. 3 (OH)	Y:	-0.0368	+0.00002	+ 9.6122 6.119665	+0.41356 4.5383	+0.008577 2.8076	+0.0134 3.6627

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES					
		DU SATELLITE 5 D'URANUS: MIRANDA					
		N=4.4880					
		A0	A1	B0 FO	B1 F1	B2 F2	C0 PO

JUILLET							

JUL. 1 (OH) (2446612.5)	X:	-0.0139	-0.00002	+ 9.8091 6.088095	+0.42514 4.5078	+0.009032 2.7568	+0.0123 5.2230
A JUL. 9 (OH)	Y:	-0.0361	+0.00001	+ 9.5946 1.376220	+0.41591 6.0789	+0.008798 4.3113	+0.0134 0.4160

JUL. 9 (OH) (2446620.5)	X:	-0.0139	-0.00001	+ 9.7802 3.950028	+0.42296 2.3670	+0.008998 0.6363	+0.0134 0.8670
A JUL. 17 (OH)	Y:	-0.0364	+0.00003	+ 9.5688 5.522311	+0.41368 3.9365	+0.008624 2.1915	+0.0126 2.5362

JUL. 17 (OH) (2446628.5)	X:	-0.0142	-0.00004	+ 9.7401 1.811758	+0.42286 0.2291	+0.009158 4.7649	+0.0133 2.9794
A JUL. 25 (OH)	Y:	-0.0358	+0.00005	+ 9.5288 3.384818	+0.41283 1.8018	+0.008876 0.0539	+0.0119 4.4052

JUL. 25 (OH) (2446636.5)	X:	-0.0148	-0.00001	+ 9.6963 5.956160	+0.42214 4.3671	+0.008923 2.6092	+0.0120 4.8950
A AOU. 2 (OH)	Y:	-0.0353	+0.00002	+ 9.4859 1.247018	+0.41353 5.9424	+0.008780 4.1681	+0.0134 0.1616

AOUT							

AOU. 1 (OH) (2446643.5)	X:	-0.0150	-0.00001	+ 9.6517 5.655063	+0.42089 4.0624	+0.008803 2.3005	+0.0125 4.2196
A AOU. 9 (OH)	Y:	-0.0351	+0.00003	+ 9.4416 0.946350	+0.41182 5.6405	+0.008773 3.8709	+0.0130 5.8994

AOU. 9 (OH) (2446651.5)	X:	-0.0147	+0.00000	+ 9.5933 3.514940	+0.41681 1.9226	+0.008808 0.1892	+0.0134 0.0534
A AOU. 17 (OH)	Y:	-0.0350	+0.00005	+ 9.3866 5.089968	+0.40876 3.4989	+0.008695 1.7467	+0.0119 1.5491

AOU. 17 (OH) (2446659.5)	X:	-0.0150	-0.00003	+ 9.5293 1.374978	+0.41644 6.0679	+0.008976 4.3066	+0.0114 2.0323
A AOU. 25 (OH)	Y:	-0.0345	+0.00005	+ 9.3243 2.950060	+0.40730 1.3607	+0.008810 5.8826	+0.0131 3.5365

AOU. 25 (OH) (2446667.5)	X:	-0.0156	+0.00000	+ 9.4682 5.517640	+0.41452 3.9208	+0.008637 2.1522	+0.0127 3.9179
A SEP. 2 (OH)	Y:	-0.0341	+0.00003	+ 9.2625 0.809648	+0.40576 5.4999	+0.008652 3.7311	+0.0123 5.6089

SEPTEMBRE							

SEP. 1 (OH) (2446674.5)	X:	-0.0158	+0.00000	+ 9.4103 5.215184	+0.41267 3.6179	+0.008593 1.8436	+0.0132 3.3568
A SEP. 9 (OH)	Y:	-0.0340	+0.00004	+ 9.2061 0.506903	+0.40295 5.1959	+0.008556 3.4385	+0.0117 4.9545

SEP. 9 (OH) (2446682.5)	X:	-0.0154	+0.00000	+ 9.3423 3.073662	+0.40799 1.4791	+0.008618 6.0160	+0.0116 5.4293
A SEP. 17 (OH)	Y:	-0.0335	+0.00006	+ 9.1392 4.648435	+0.39974 3.0565	+0.008615 1.3101	+0.0128 0.6412

SEP. 17 (OH) (2446690.5)	X:	-0.0156	-0.00003	+ 9.2744 0.932578	+0.40724 5.6243	+0.008750 3.8506	+0.0119 0.9863
A SEP. 25 (OH)	Y:	-0.0331	+0.00003	+ 9.0734 2.506686	+0.39856 0.9149	+0.008586 5.4326	+0.0121 2.7281

SEP. 25 (OH) (2446698.5)	X:	-0.0161	+0.00000	+ 9.2137 5.074271	+0.40470 3.4781	+0.008436 1.7028	+0.0129 3.0867
A OCT. 3 (OH)	Y:	-0.0330	+0.00004	+ 9.0113 0.364310	+0.39538 5.0532	+0.008360 3.3001	+0.0115 4.6164

1986

COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 5 D'URANUS: MIRANDA

N=4.4880

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
OCTOBRE							
OCT. 1 (OH) (2446704.5)	X:	-0.0159	-0.00001	+ 9.1643 0.326398	+0.40244 5.0193	+0.008633 3.2467	+0.0128 6.1616
A OCT. 9 (OH)	Y:	-0.0324	+0.00002	+ 8.9644 1.899236	+0.39503 0.3060	+0.008388 4.8145	+0.0110 1.3696
OCT. 9 (OH) (2446712.5)	X:	-0.0161	+0.00000	+ 9.1073 4.467866	+0.39913 2.8764	+0.008449 1.1158	+0.0116 1.8539
A OCT. 17 (OH)	Y:	-0.0326	+0.00003	+ 8.9078 6.039412	+0.39095 4.4440	+0.008127 2.6959	+0.0125 3.4208
OCT.17 (OH) (2446720.5)	X:	-0.0161	-0.00001	+ 9.0513 2.326175	+0.39618 0.7389	+0.008517 5.2672	+0.0125 3.8000
A OCT.25 (OH)	Y:	-0.0320	+0.00005	+ 8.8501 3.896475	+0.38844 2.3082	+0.008346 0.5634	+0.0109 5.4878
OCT.25 (OH) (2446728.5)	X:	-0.0163	-0.00001	+ 9.0017 0.184881	+0.39479 4.8814	+0.008427 3.1142	+0.0123 5.8864
A NOV. 2 (OH)	Y:	-0.0315	+0.00001	+ 8.8019 1.753889	+0.38841 0.1646	+0.008222 4.6726	+0.0112 1.0348
NOVEMBRE							
NOV. 1 (OH) (2446735.5)	X:	-0.0165	+0.00000	+ 8.9637 6.165179	+0.39253 4.5784	+0.008296 2.8175	+0.0113 5.2629
A NOV. 9 (OH)	Y:	-0.0313	+0.00001	+ 8.7632 1.449656	+0.38694 6.1454	+0.008190 4.3673	+0.0122 0.4437
NOV. 9 (OH) (2446743.5)	X:	-0.0164	+0.00000	+ 8.9247 4.023876	+0.38909 2.4392	+0.008228 0.7024	+0.0122 0.8980
A NOV.17 (OH)	Y:	-0.0316	+0.00002	+ 8.7267 5.589683	+0.38337 4.0021	+0.007993 2.2517	+0.0115 2.5632
NOV.17 (OH) (2446751.5)	X:	-0.0166	-0.00002	+ 8.8901 1.883183	+0.38810 0.3034	+0.008338 4.8375	+0.0122 3.0062
A NOV.25 (OH)	Y:	-0.0312	+0.00004	+ 8.6923 3.446974	+0.38181 1.8671	+0.008200 0.1165	+0.0108 4.4271
NOV.25 (OH) (2446759.5)	X:	-0.0170	-0.00001	+ 8.8655 6.026007	+0.38703 4.4444	+0.008110 2.6904	+0.0110 4.9310
A DEC. 3 (OH)	Y:	-0.0308	+0.00000	+ 8.6695 1.304828	+0.38209 6.0078	+0.008078 4.2354	+0.0123 0.1775
DECEMBRE							
DEC. 1 (OH) (2446765.5)	X:	-0.0168	-0.00003	+ 8.8482 1.279356	+0.38626 5.9856	+0.008231 4.2299	+0.0105 1.7010
A DEC. 9 (OH)	Y:	-0.0309	+0.00001	+ 8.6549 2.839515	+0.37994 1.2646	+0.008177 5.7943	+0.0123 3.2809
DEC. 9 (OH) (2446773.5)	X:	-0.0174	+0.00000	+ 8.8370 5.422833	+0.38535 3.8424	+0.007927 2.0863	+0.0123 3.6616
A DEC.17 (OH)	Y:	-0.0308	+0.00000	+ 8.6457 0.697704	+0.37915 5.4059	+0.008025 3.6548	+0.0112 5.3036
DEC.17 (OH) (2446781.5)	X:	-0.0171	+0.00000	+ 8.8282 3.283182	+0.38258 1.7081	+0.007993 6.2669	+0.0115 5.7948
A DEC.25 (OH)	Y:	-0.0308	+0.00001	+ 8.6426 4.839258	+0.37755 3.2683	+0.008057 1.5340	+0.0117 0.9378
DEC.25 (OH) (2446789.5)	X:	-0.0173	-0.00004	+ 8.8259 1.144654	+0.38396 5.8579	+0.008149 4.1056	+0.0108 1.3674
A DEC.33 (OH)	Y:	-0.0306	+0.00000	+ 8.6467 2.698413	+0.37809 1.1312	+0.008102 5.6679	+0.0121 3.0260

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES					
		DU SATELLITE 1 D'URANUS: ARIEL				N=2.4930	
		AO	A1	B0 FO	B1 F1	B2 F2	CO PO
JAN. 1 (OH)	X:	+0.0669	+0.00003	+13.1434	+0.00490	+0.000083	+0.0224
(2446431.5)				2.553222	1.8433	2.9891	0.3387
A FEV. 2 (OH)	Y:	-0.0031	+0.00000	+13.0096	+0.00651	+0.000090	+0.0223
				4.121142	3.1804	4.6060	1.8988
FEV. 1 (OH)	X:	+0.0678	+0.00005	+13.3306	+0.00857	+0.000063	+0.0230
(2446462.5)				4.433093	4.3243	5.0476	4.0997
A MAR. 5 (OH)	Y:	-0.0030	+0.00000	+13.2046	+0.00931	+0.000068	+0.0228
				5.996641	5.7189	0.5008	5.6539
MAR. 1 (OH)	X:	+0.0694	+0.00005	+13.6085	+0.01168	+0.000030	+0.0236
(2446490.5)				5.122200	5.2223	0.0421	5.4695
A AVR. 2 (OH)	Y:	-0.0031	-0.00002	+13.4920	+0.01190	+0.000045	+0.0233
				0.399913	0.4212	1.8979	0.7497
AVR. 1 (OH)	X:	+0.0711	+0.00006	+13.9780	+0.01275	+0.000051	+0.0241
(2446521.5)				0.728311	0.9624	3.6322	2.9625
A MAI 3 (OH)	Y:	-0.0039	-0.00002	+13.8628	+0.01261	+0.000061	+0.0237
				2.288346	2.5405	4.9893	4.5177
MAI 1 (OH)	X:	+0.0728	+0.00003	+14.3046	+0.01016	+0.000104	+0.0245
(2446551.5)				0.127013	0.4967	3.3863	1.7456
A JUN. 2 (OH)	Y:	-0.0051	-0.00003	+14.1790	+0.01010	+0.000101	+0.0243
				1.688364	2.1809	4.8708	3.3026
JUN. 1 (OH)	X:	+0.0737	+0.00000	+14.4993	+0.00408	+0.000126	+0.0247
(2446582.5)				2.018801	2.8028	5.4378	5.5106
A JUL. 3 (OH)	Y:	-0.0064	-0.00004	+14.3582	+0.00512	+0.000120	+0.0243
				3.583113	4.6569	0.7471	0.7898
JUL. 1 (OH)	X:	+0.0735	-0.00003	+14.4779	+0.00464	+0.000102	+0.0244
(2446612.5)				1.414421	4.3844	4.9948	4.2858
A AOU. 2 (OH)	Y:	-0.0077	-0.00003	+14.3294	+0.00520	+0.000103	+0.0243
				2.982012	5.6669	0.3856	5.8444
AOU. 1 (OH)	X:	+0.0723	-0.00006	+14.2484	+0.01062	+0.000051	+0.0239
(2446643.5)				3.298012	0.3417	0.9643	1.7484
A SEP. 2 (OH)	Y:	-0.0089	-0.00001	+14.1016	+0.01032	+0.000063	+0.0237
				4.868181	1.8389	2.6740	3.3075
SEP. 1 (OH)	X:	+0.0700	-0.00004	+13.8926	+0.01336	+0.000026	+0.0232
(2446674.5)				5.175902	2.3704	4.3255	5.4892
A OCT. 3 (OH)	Y:	-0.0095	+0.00000	+13.7499	+0.01330	+0.000039	+0.0230
				0.463620	3.9493	5.6312	0.7743
OCT. 1 (OH)	X:	+0.0681	-0.00004	+13.5314	+0.01287	+0.000053	+0.0227
(2446704.5)				4.556613	1.8814	4.5209	4.2390
A NOV. 2 (OH)	Y:	-0.0097	+0.00001	+13.3913	+0.01329	+0.000059	+0.0225
				6.126229	3.5192	5.8971	5.8080
NOV. 1 (OH)	X:	+0.0667	-0.00002	+13.2283	+0.01005	+0.000076	+0.0224
(2446735.5)				0.144531	3.9292	0.3357	1.6988
A DEC. 3 (OH)	Y:	-0.0094	+0.00001	+13.0938	+0.01094	+0.000081	+0.0221
				1.710845	5.6411	1.8084	3.2625
DEC. 1 (OH)	X:	+0.0658	+0.00000	+13.0553	+0.00626	+0.000087	+0.0221
(2446765.5)				5.806666	3.6486	6.1201	0.4569
A DEC.33 (OH)	Y:	-0.0091	+0.00000	+12.9374	+0.00780	+0.000093	+0.0220
				1.085213	5.4525	1.3681	2.0153

1986

COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 2 D'URANUS: UMBRIEL

N=1.5162

		AO	A1	BO FO	B1 F1	B2 F2	CO PO
JAN. 1 (OH) (2446431.5)	X:	+0.1073	+0.00005	+18.3233 3.264021	+0.00754 2.4616	+0.000111 3.6167	+0.0461 2.4800
A FEV. 2 (OH)	Y:	+0.0850	+0.00007	+18.1628 4.832322	+0.00966 3.8518	+0.000120 5.2253	+0.0458 4.0503
FEV. 1 (OH) (2446462.5)	X:	+0.1088	+0.00008	+18.5853 6.276877	+0.01226 6.0333	+0.000084 0.5457	+0.0469 2.2332
A MAR. 5 (OH)	Y:	+0.0872	+0.00007	+18.4360 1.557938	+0.01342 1.1740	+0.000091 2.2790	+0.0466 3.7890
MAR. 1 (OH) (2446490.5)	X:	+0.1111	+0.00010	+18.9735 4.745615	+0.01622 4.7223	+0.000044 5.9669	+0.0482 5.4536
A AVR. 2 (OH)	Y:	+0.0894	+0.00007	+18.8368 0.024263	+0.01669 6.2170	+0.000062 1.5144	+0.0476 0.7279
AVR. 1 (OH) (2446521.5)	X:	+0.1144	+0.00012	+19.4885 1.483747	+0.01742 1.6114	+0.000074 4.2504	+0.0491 5.2092
A MAI 3 (OH)	Y:	+0.0915	+0.00004	+19.3549 3.044807	+0.01724 3.1871	+0.000090 5.6512	+0.0491 0.4927
MAI 1 (OH) (2446551.5)	X:	+0.1178	+0.00008	+19.9438 2.991975	+0.01376 3.2740	+0.000145 6.1401	+0.0504 1.9320
A JUN. 2 (OH)	Y:	+0.0926	+0.00000	+19.7962 4.554251	+0.01352 4.9558	+0.000142 1.3481	+0.0499 3.5067
JUN. 1 (OH) (2446582.5)	X:	+0.1205	+0.00003	+20.2144 6.017677	+0.00549 0.4837	+0.000172 3.0574	+0.0506 1.6939
A JUL. 3 (OH)	Y:	+0.0922	-0.00006	+20.0462 1.299523	+0.00679 2.3420	+0.000164 4.6527	+0.0501 3.2546
JUL. 1 (OH) (2446612.5)	X:	+0.1213	-0.00002	+20.1841 1.242351	+0.00669 4.0966	+0.000138 4.7525	+0.0502 4.6979
A ADU. 2 (OH)	Y:	+0.0902	-0.00008	+20.0058 2.810440	+0.00754 5.4239	+0.000138 0.1407	+0.0496 6.2561
ADU. 1 (OH) (2446643.5)	X:	+0.1204	-0.00007	+19.8633 4.262813	+0.01458 1.2060	+0.000069 1.8854	+0.0490 4.4337
A SEP. 2 (OH)	Y:	+0.0872	-0.00009	+19.6875 5.833277	+0.01436 2.7055	+0.000083 3.6145	+0.0485 6.0154
SEP. 1 (OH) (2446674.5)	X:	+0.1177	-0.00009	+19.3669 0.995208	+0.01808 4.3746	+0.000043 0.0444	+0.0477 4.1813
A OCT. 3 (OH)	Y:	+0.0841	-0.00007	+19.1964 2.566366	+0.01804 5.9577	+0.000057 1.4416	+0.0475 5.7405
OCT. 1 (OH) (2446704.5)	X:	+0.1150	-0.00008	+18.8641 2.490492	+0.01731 6.0162	+0.000078 2.3172	+0.0465 0.8801
A NOV. 2 (OH)	Y:	+0.0818	-0.00003	+18.6962 4.060457	+0.01776 1.3717	+0.000085 3.7247	+0.0463 2.4462
NOV. 1 (OH) (2446735.5)	X:	+0.1121	-0.00004	+18.4423 5.498818	+0.01341 2.9462	+0.000104 5.5604	+0.0458 0.6140
A DEC. 3 (OH)	Y:	+0.0803	+0.00000	+18.2807 0.782558	+0.01448 4.6573	+0.000113 0.7637	+0.0453 2.1802
DEC. 1 (OH) (2446765.5)	X:	+0.1105	-0.00001	+18.2025 0.707380	+0.00857 4.8265	+0.000117 0.8940	+0.0453 3.6029
A DEC.33 (OH)	Y:	+0.0802	+0.00004	+18.0628 2.270085	+0.01056 0.3422	+0.000127 2.4423	+0.0452 5.1623

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES					
		DU SATELLITE 3 D'URANUS: TITANIA					
		N=0.7217					
		AO	A1	BO FO	B1 F1	B2 F2	CO PO
JAN. 1 (OH) (2446431.5)	X:	-0.0766	-0.00004	+29.9909 0.977882	+0.01120 0.2527	+0.000178 1.2332	+0.0333 5.9835
A FEV. 2 (OH)	Y:	+0.0613	+0.00002	+29.7148 2.545367	+0.01475 1.6143	+0.000190 2.8525	+0.0330 1.2648
FEV. 1 (OH) (2446462.5)	X:	-0.0783	-0.00005	+30.4151 4.494885	+0.01984 4.2637	+0.000134 4.9784	+0.0337 0.4570
A MAR. 5 (OH)	Y:	+0.0618	+0.00002	+30.1610 6.058198	+0.02192 5.6842	+0.000142 0.4429	+0.0334 2.0183
MAR. 1 (OH) (2446490.5)	X:	-0.0796	-0.00008	+31.0464 5.850395	+0.02653 5.8145	+0.000072 0.7706	+0.0345 3.1771
A AVR. 2 (OH)	Y:	+0.0628	+0.00006	+30.8180 1.128035	+0.02730 1.0197	+0.000106 2.6073	+0.0343 4.7377
AVR. 1 (OH) (2446521.5)	X:	-0.0825	-0.00003	+31.8881 3.091444	+0.02862 3.2101	+0.000126 5.7992	+0.0356 3.9332
A MAI 3 (OH)	Y:	+0.0645	+0.00006	+31.6652 4.651441	+0.02811 4.7851	+0.000152 0.9008	+0.0354 5.4939
MAI 1 (OH) (2446551.5)	X:	-0.0834	-0.00002	+32.6352 5.897449	+0.02273 6.1967	+0.000236 2.6773	+0.0361 3.2653
A JUN. 2 (OH)	Y:	+0.0665	+0.00007	+32.3873 1.175534	+0.02229 1.5950	+0.000235 4.1533	+0.0358 4.8269
JUN. 1 (OH) (2446582.5)	X:	-0.0843	+0.00002	+33.0822 3.144198	+0.01032 4.0100	+0.000278 0.1000	+0.0364 4.0325
A JUL. 3 (OH)	Y:	+0.0685	+0.00002	+32.7964 4.708295	+0.01277 5.8239	+0.000266 1.6966	+0.0362 5.5978
JUL. 1 (OH) (2446612.5)	X:	-0.0838	+0.00008	+33.0371 5.952022	+0.01216 2.2735	+0.000219 3.0918	+0.0361 3.3491
A AOU. 2 (OH)	Y:	+0.0690	+0.00000	+32.7305 1.236082	+0.01428 3.6452	+0.000221 4.7853	+0.0358 4.9165
AOU. 1 (OH) (2446643.5)	X:	-0.0813	+0.00006	+32.5152 3.196099	+0.02392 6.2396	+0.000107 0.7735	+0.0353 4.1200
A SEP. 2 (OH)	Y:	+0.0689	-0.00002	+32.2099 4.765800	+0.02377 1.4511	+0.000134 2.5175	+0.0350 5.6896
SEP. 1 (OH) (2446674.5)	X:	-0.0795	+0.00008	+31.7033 0.436193	+0.02895 3.6516	+0.000075 5.7616	+0.0344 4.8660
A OCT. 3 (OH)	Y:	+0.0678	-0.00007	+31.4074 2.006641	+0.02873 5.2357	+0.000100 0.8585	+0.0341 0.1533
OCT. 1 (OH) (2446704.5)	X:	-0.0769	+0.00005	+30.8778 3.233797	+0.02697 0.3160	+0.000129 2.9527	+0.0335 4.1834
A NOV. 2 (OH)	Y:	+0.0656	-0.00005	+30.5879 4.802996	+0.02734 1.9673	+0.000144 4.3737	+0.0332 5.7512
NOV. 1 (OH) (2446735.5)	X:	-0.0756	+0.00002	+30.1839 0.466481	+0.02025 4.0349	+0.000172 0.4106	+0.0330 4.9295
A DEC. 3 (OH)	Y:	+0.0639	-0.00005	+29.9093 2.032532	+0.02148 5.7800	+0.000190 1.9138	+0.0327 0.2104
DEC. 1 (OH) (2446765.5)	X:	-0.0748	+0.00000	+29.7862 3.259210	+0.01208 0.9643	+0.000189 3.3508	+0.0327 4.2400
A DEC.33 (OH)	Y:	+0.0622	-0.00001	+29.5519 4.820906	+0.01501 2.8385	+0.000206 4.9052	+0.0324 5.7985

1986		COORDONNEES EQUATORIALES DIFFERENTIELLES					
		DU SATELLITE 4 D'URANUS: OBERON				N=0.4667	
		AO	A1	BO FO	B1 F1	B2 F2	CO PO
JAN. 1 (OH)	X:	-0.0057	-0.00001	+40.1489	+0.01595	+0.000234	+0.0161
(2446431.5)				5.707134	4.9295	5.9118	2.1057
A FEV. 2 (OH)	Y:	+0.0479	-0.00001	+39.7776	+0.02085	+0.000253	+0.0161
				0.991872	0.0181	1.2681	3.6725
FEV. 1 (OH)	X:	-0.0055	-0.00004	+40.7204	+0.02713	+0.000177	+0.0164
(2446462.5)				1.317914	1.0178	1.7619	5.9029
A MAR. 5 (OH)	Y:	+0.0474	+0.00007	+40.3728	+0.03027	+0.000182	+0.0164
				2.881631	2.4493	3.5501	1.1889
MAR. 1 (OH)	X:	-0.0062	-0.00001	+41.5683	+0.03563	+0.000091	+0.0168
(2446490.5)				1.815160	1.7193	2.9873	0.6330
A AVR. 2 (OH)	Y:	+0.0477	+0.00012	+41.2513	+0.03705	+0.000142	+0.0168
				3.376429	3.2054	4.8774	2.1746
AVR. 1 (OH)	X:	-0.0080	+0.00009	+42.6955	+0.03797	+0.000170	+0.0173
(2446521.5)				3.715946	3.7676	0.0627	4.4282
A MAI 3 (OH)	Y:	+0.0508	+0.00001	+42.3858	+0.03759	+0.000208	+0.0174
				5.276286	5.3517	1.5392	5.9730
MAI 1 (OH)	X:	-0.0062	-0.00001	+43.6943	+0.02989	+0.000318	+0.0175
(2446551.5)				5.153561	5.3930	1.9134	1.0003
A JUN. 2 (OH)	Y:	+0.0524	-0.00001	+43.3536	+0.02906	+0.000315	+0.0176
				0.432092	0.7857	3.3739	2.5744
JUN. 1 (OH)	X:	-0.0065	+0.00004	+44.2905	+0.01277	+0.000370	+0.0176
(2446582.5)				0.777301	1.5856	3.9939	4.8162
A JUL. 3 (OH)	Y:	+0.0518	+0.00003	+43.9014	+0.01579	+0.000356	+0.0177
				2.341826	3.4107	5.5673	0.0972
JUL. 1 (OH)	X:	-0.0058	+0.00001	+44.2271	+0.01599	+0.000288	+0.0174
(2446612.5)				2.217637	4.8687	5.6000	1.3947
A AOU. 2 (OH)	Y:	+0.0534	-0.00008	+43.8152	+0.01880	+0.000294	+0.0174
				3.785233	6.2185	1.0339	2.9795
AOU. 1 (OH)	X:	-0.0041	-0.00005	+43.5254	+0.03189	+0.000148	+0.0171
(2446643.5)				4.122759	0.8809	1.6773	5.2007
A SEP. 2 (OH)	Y:	+0.0509	+0.00000	+43.1194	+0.03205	+0.000170	+0.0170
				5.692887	2.3844	3.4587	0.5089
SEP. 1 (OH)	X:	-0.0058	+0.00006	+42.4401	+0.03884	+0.000104	+0.0168
(2446674.5)				6.024271	2.9534	5.0782	2.7151
A OCT. 3 (OH)	Y:	+0.0496	+0.00000	+42.0421	+0.03832	+0.000132	+0.0166
				1.311907	4.5377	0.1353	4.3034
OCT. 1 (OH)	X:	-0.0052	+0.00002	+41.3345	+0.03595	+0.000172	+0.0165
(2446704.5)				1.171920	4.5377	0.8485	5.5804
A NOV. 2 (OH)	Y:	+0.0496	-0.00007	+40.9476	+0.03676	+0.000202	+0.0161
				2.741506	6.1842	2.2779	0.8623
NOV. 1 (OH)	X:	-0.0046	-0.00002	+40.4089	+0.02720	+0.000230	+0.0161
(2446735.5)				3.065830	0.3656	2.9674	3.0883
A DEC. 3 (OH)	Y:	+0.0476	+0.00000	+40.0366	+0.02901	+0.000254	+0.0158
				4.632299	2.1106	4.4865	4.6476
DEC. 1 (OH)	X:	-0.0053	+0.00000	+39.8796	+0.01687	+0.000253	+0.0159
(2446765.5)				4.491248	2.2414	4.5536	5.9467
A DEC.33 (OH)	Y:	+0.0468	+0.00001	+39.5584	+0.02094	+0.000275	+0.0158
				6.053327	4.0866	6.0980	1.2174

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Ces éphémérides donnent les positions des satellites Galiléens de Jupiter, des huit premiers satellites de Saturne et des cinq satellites d'Uranus pour 1986 avec une précision de 0.01 seconde de degré ("). Elles sont ainsi très utiles aux astronomes pour préparer ou réduire des observations de haute précision ainsi que pour étudier les mouvements des satellites naturels des planètes.

Les positions sont données sous forme de coefficients de fonctions élémentaires dépendant directement du temps. Les calculs sont faciles à programmer sur une calculatrice de poche ou sur un micro-ordinateur.

Cet ouvrage donne aussi une méthode pour effectuer les prédictions des phénomènes des satellites de Jupiter en 1986.

De telles éphémérides, uniques par leur contenu, méritent de figurer dans les bibliothèques des Universités et des Observatoires.

These ephemerides give the positions of the Galilean satellites of Jupiter, of the first eight satellites of Saturn and of the five satellites of Uranus for 1986 with an accuracy of 0.01 arcsecond (").

Thus, they are very useful to astronomers in order to prepare or reduce precise observations and to study the motions of the natural satellites of the planets.

The positions are given as coefficients of elementary functions depending directly on time. The calculations are easy to program on a pocket calculator or on a micro-computer.

This booklet also contains a method of calculation to predict the phenomena of the satellites of Jupiter in 1986.

Such ephemerides of unique nature, have their place in the libraries of Universities and Observatories.

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