Ephémérides des satellites de Jupiter, Saturne et Uranus pour 1988

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SUPPLEMENT A LA CONNAISSANCE DES TEMPS - PARIS 1987
BUREAU DES LONGITUDES

ÉPHÉMÉRIDES DES SATELLITES DE JUPITER, SATURNE ET URANUS POUR 1988

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PUBLICATIONS DU BUREAU DES LONGITUDES

• La *Connaissance des Temps* (Ephémérides Astronomiques de la Lune et des planètes pour 1988). 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 1988

• Phénomènes et configurations des satellites Galiléens de Jupiter pour 1988

• Configurations des huit premiers satellites de Saturne pour 1988

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

- Annuaire du Bureau des Longitudes, Ephémérides pour 1988
- Ephémérides nautiques pour l'an 1988
- 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 1988). 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 1988*

• *Phenomena and configurations of the Galilean Satellites of Jupiter for 1988*

• *Configurations of the First Eight Satellites of Saturn for 1988*

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

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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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 tangentielles 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 Kozaï (1959) et de Struve (1930) ;

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

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), Kozaï (1959) and Struve (1930) ;

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

REPRÉSENTATION DES COORDONNÉES

Soit T une date Julienne appartenant à l'intervalle de temps $T0, T0 + \Delta t$, les coordonnées des satellites pour la date T sont données par la formule :

REPRESENTATION OF THE COORDINATES

Let T be a Julian date belonging to the interval of time $T0$, $T0 + \Delta t$. The coordinates of the satellites for the date T are given by the formula :

$$\left.\begin{matrix} X \\ Y \end{matrix}\right\} = A0 + A1 \cdot t + B0 \sin(Nt + F0) + B1 \cdot t \sin(Nt + F1) + B2 \cdot t^2 \sin(Nt + F2) + C0 \sin(2Nt + P0) \quad (1)$$

où :

- $t = T - T0$
- $A0, A1, B0, F0, B1, F1, B2, F2, C0, P0$ sont les coefficients numériques valables pour l'intervalle de temps $T0, T0 + \Delta t$ 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).

where :

- $t = T - T0$
- *$A0, A1, B0, F0, B1, F1, B2, F2, C0, P0$ are numerical coefficients valid for the time interval $T0, T0 + \Delta t$*
- *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 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 $A0, A1, B0, F0, B1, F1, B2, F2, C0, P0$: 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 $A0, B0, C0$, la seconde de degré par jour pour $A1, B1$, la seconde de degré par $(\text{jour})^2$ pour $B2$; les phases $F0, F1, F2, P0$ 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 $T0$).

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 $A0, A1, B0, F0, B1, F1, B2, F2, C0, P0$: 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 : $A0, B0, C0$ in arcsecond ; $A1$ and $B1$ in arcsecond per day and $B2$ in arcsecond per $(\text{day})^2$. For phases $F0, F1, F2, P0$ the unit is the radian. N is expressed in radian per day and t in days from the beginning of the interval (epoch $T0$).

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 :

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

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 :

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

Les événements astronomiques étant mesurés dans l'échelle UTC (temps universel coordonné), le tableau ci-dessous donne la relation (entre le 1 janvier 1979 et le 1 juillet 1986) 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 1986 July 1) between TDT and UTC (using the relationship between TAI and UTC published by BIH).

	TDT-UTC
1979 Jan. 1 - 1980 Jan. 1	50.184 s
1980 Jan. 1 - 1981 Juil. 1	51.184 s
1981 Juil. 1 - 1982 Juil. 1	52.184 s
1982 Juil. 1 - 1983 Juil. 1	53.184 s
1983 Juil. 1 - 1985 Juil. 1	54.184 s
1985 Juil. 1 - 1987 Juil. 1	55.184 s

Pour 1987, on ne sait pas encore quelle en sera la valeur ; on peut cependant prendre 57 secondes, l'erreur commise n'ayant que peu d'influence sur la valeur des positions calculées des satellites.

For 1987 the value of TDT-UTC is not yet known ; one may take 57 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 $T0, T0 + \Delta t$ dans lequel se trouve T ;
— on applique la formule (1) avec $t = T - T0$.

Il faut insister sur le fait que la représentation n'est valable que sur son intervalle de validité : T doit être compris entre $T0$ et $T0 + \Delta t$.

EXEMPLE : Calculer les coordonnées tangentielles de Téthys (3e satellite de Saturne) par rapport à la planète, le 5 janvier 1988 à 23 h 30 min UTC.

On effectue d'abord une correction pour se ramener à l'échelle TDB. Pour 1988 nous avons choisi 56 secondes ; la date T est donc le 5 janvier 1988 à 23 h 30 min 56 s TDB.

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

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 $T0$, $T0 + \Delta t$ where T is found ;
— apply formula (1) with $t = T - T0$.

It is important to state that the representation is valid only for its time interval : T must belong to the interval $T0$, $T0 + \Delta t$.

EXAMPLE : Let us compute the tangential coordinates of Tethys (third satellite of Saturn) with respect to the planet for 1988 January 5, 23 h 30 min UTC.

First, the date must be corrected in order to fit with the TDB time-scale. For 1988, we choose 56 seconds ; so, the date T is 1988 January 5, 23 h 30 min 56 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 :

$$A0 = 0.,\ A1 = 0.,\ B0 = 36.8643,\ B1 = 0.06764,\ B2 = 0.000426,\ C0 = 0.0030$$
$$F0 = 0.621020,\ F1 = 5.5279,\ F2 = 1.1143,\ P0 = 4.3150$$

et pour Y :

and for Y :

$$A0 = -0.0013,\ A1 = 0.,\ B0 = 17.5366,\ B1 = 0.02243,\ B2 = 0.000176,\ C0 = 0.0014$$
$$F0 = 2.340442,\ F1 = 0.9974,\ F2 = 2.9082,\ P0 = 6.0423$$

On applique ensuite la formule (1) :

We then apply formula (1) :

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

On a ici :

N = 3,328 radian/jour
t est le nombre de jours écoulés entre le 1 janvier à 0 h (début de l'intervalle) et le 5 janvier à 23 h 30 min 56 s, soit 4,979 826 jours.

On obtient finalement :

$$X = -\ 36{,}78''$$
$$Y = +\ 1{,}01''$$

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".

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.

Where :

N = 3.328 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 56 s. Hence t = 4.979 826 days.

Finally, we get :

$$X = -\ 36.78''$$
$$Y = +\ 1.01''$$

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".

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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Note : Les calculs nécessaires à l'élaboration de cet ouvrage ont été effectués sur l'ordinateur NAS 9080 du Centre Inter-Régional de Calcul Electronique du CNRS, F-91405 ORSAY (France).

Nota : The calculations performed in order to build these tables have been made on the NAS 9080 computer of the Centre Inter-Régional de Calcul Electronique of the CNRS, F-91405 ORSAY (France).

SATELLITES DE JUPITER

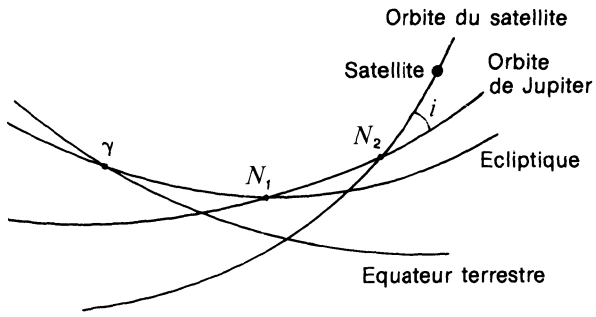
SATELLITES OF JUPITER

DONNÉES SUR LES SATELLITES GALILÉENS
DATA ON THE GALILEAN SATELLITES

	IO (I)	EUROPE (II)	GANYMÈDE (III)	CALLISTO (IV)
Masses (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
Pionneer 11 (1976) :	4.68	2.52	7.80	5.66
Rayons (km)				
Danjon (1954) :	1650	1400	2450	2300
Dollfus (1961) :	1775	1550	2800	2525
Pionneer 11 (1976) :	1840	1552	2650	2420
Voyager (1983) :	1816	1563	2638	2410
Magnitudes visuelles à l'opposition de Jupiter :				
Harris (1961) :	4.8	5.2	4.5	5.5
Albedos géométriques (Harris, 1961)				
U : 353 nm	0.19	0.47	0.29	0.14
B : 448 nm	0.56	0.67	0.41	0.21
V : 554 nm	0.92	0.83	0.49	0.26
R : 690 nm	1.12	0.93	0.56	0.30
I : 820 nm	1.15	0.95	0.57	0.31
Albédo de Bond (visuel)	0.54	0.49	0.29	0.15
Demi-grand axe (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
Plus grande élongation à l'opposition de Jupiter (minutes et secondes de degré)				
Sampson (1921) :	2′ 17″	3′ 40″	5′ 48″	10′ 13″
Période synodique (jours)				
Sampson (1921) :	1.7698604883	3.5540941742	7.1663872292	16.7535523007
Inclinaison moyenne sur l'équateur de Jupiter pour 1988.5 (minutes et secondes de degré)				
Sampson (1921) :	1′52″	26′17″	11′10″	20′31″
Valeur moyenne de l'excentricité pour 1988.5				
Sampson (1921) :	0.004	0.009	0.001	0.007
Partie séculaire du mouvement (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 τ 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 τ is the time in days which has elapsed from 1900.0, one gets :

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

	$\gamma N_1 + N_1 N_2 + N_2 M$	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 Ganymede	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	$38. \times 10^{-10}$	$135 \times 85 \times 75$	(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 tangentielles 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.

$$\Delta\alpha \cos\delta = X$$
$$\Delta\delta = Y$$

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

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 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)*	

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 1 DE JUPITER: IO N=3.5516

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
JAN. 1 (OH)	X:	-0.3198	+0.01030	+113.6087	+0.40357	+0.006844	+0.2025
(2447161.5)				1.348434	4.8285	0.1225	2.1729
A JAN. 5 (OH)	Y:	-0.1766	+0.00445	+ 50.1873	+0.20232		+0.0884
				1.478575	5.0095		2.3047
JAN. 5 (OH)	X:	-0.2831	+0.01006	+112.1146	+0.39282	+0.007534	+0.1988
(2447165.5)				2.982731	0.2488	1.4357	5.4982
A JAN. 9 (OH)	Y:	-0.1611	+0.00471	+ 49.4376	+0.20486		+0.0877
				3.112381	0.3986		5.6400
JAN. 9 (OH)	X:	-0.2428	+0.01209	+110.6694	+0.40056	+0.004074	+0.1954
(2447169.5)				4.616195	1.9702	3.1716	2.5563
A JAN.13 (OH)	Y:	-0.1444	+0.00538	+ 48.6902	+0.20824		+0.0863
				4.745481	2.0709		2.6799
JAN.13 (OH)	X:	-0.2074	+0.01272	+109.2710	+0.41047	+0.001604	+0.1931
(2447173.5)				6.248781	3.6751	5.0256	5.8852
A JAN.17 (OH)	Y:	-0.1283	+0.00556	+ 47.9474	+0.21219		+0.0845
				0.094574	3.7279		6.0126
JAN.17 (OH)	X:	-0.1566	+0.00913	+107.9059	+0.42037	+0.002617	+0.1904
(2447177.5)				1.597410	5.3947	3.0458	2.9390
A JAN.21 (OH)	Y:	-0.1063	+0.00393	+ 47.2038	+0.21385		+0.0835
				1.726183	5.3900		3.0642
JAN.21 (OH)	X:	-0.1218	+0.01049	+106.5921	+0.42165	+0.002934	+0.1884
(2447181.5)				3.228223	0.7734	3.9226	6.2637
A JAN.25 (OH)	Y:	-0.0907	+0.00451	+ 46.4659	+0.21412		+0.0816
				3.357056	0.7641		0.1061
JAN.25 (OH)	X:	-0.0726	+0.00619	+105.3273	+0.41013	+0.002001	+0.1870
(2447185.5)				4.858216	2.4271	4.3298	3.3126
A JAN.29 (OH)	Y:	-0.0689	+0.00270	+ 45.7370	+0.21386		+0.0811
				4.987238	2.4110		3.4424
JAN.29 (OH)	X:	-0.0393	+0.00904	+104.1195	+0.40872	+0.002824	+0.1841
(2447189.5)				0.204476	4.0972	5.7862	0.3562
A FEV. 2 (OH)	Y:	-0.0540	+0.00398	+ 45.0172	+0.21398		+0.0793
				0.333772	4.0664		0.4814
FEV. 1 (OH)	X:	-0.0035	+0.00635	+103.2500	+0.41193	+0.002369	+0.1839
(2447192.5)				4.567726	2.2189	4.3487	2.8541
A FEV. 5 (OH)	Y:	-0.0385	+0.00271	+ 44.4854	+0.21407		+0.0791
				4.697241	2.1603		2.9867
FEV. 5 (OH)	X:	+0.0295	+0.00862	+102.1374	+0.40686	+0.002198	+0.1815
(2447196.5)				6.196032	3.8909	5.5507	6.1784
A FEV. 9 (OH)	Y:	-0.0238	+0.00378	+ 43.7843	+0.21341		+0.0776
				0.042834	3.8101		0.0223
FEV. 9 (OH)	X:	+0.0681	+0.00799	+101.0830	+0.39585	+0.005837	+0.1810
(2447200.5)				1.540512	5.5402	0.3564	3.2182
A FEV.13 (OH)	Y:	-0.0065	+0.00354	+ 43.0953	+0.21369		+0.0766
				1.671185	5.4641		3.3558
FEV.13 (OH)	X:	+0.1021	+0.01050	+100.0812	+0.39622	+0.004036	+0.1786
(2447204.5)				3.167779	0.9550	1.7690	0.2667
A FEV.17 (OH)	Y:	+0.0078	+0.00462	+ 42.4163	+0.21214		+0.0759
				3.299042	0.8282		0.4030
FEV.17 (OH)	X:	+0.1369	+0.01095	+ 99.1465	+0.40964	+0.000644	+0.1784
(2447208.5)				4.794584	2.6490	5.5369	3.5854
A FEV.21 (OH)	Y:	+0.0226	+0.00478	+ 41.7528	+0.21144		+0.0748
				4.926516	2.4712		3.7199

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 1 DE JUPITER: IO N=3.5516

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
FEV.21 (OH)	X:	+0.1753	+0.01086	+ 98.2720	+0.40657	+0.000141	+0.1779
(2447212.5)				0.137559	4.3127	3.5612	0.6346
A FEV.25 (OH)	Y:	+0.0392	+0.00450	+ 41.1025	+0.21070		+0.0743
				0.270388	4.1084		0.7708
FEV.25 (OH)	X:	+0.2111	+0.00976	+ 97.4562	+0.41573	+0.002836	+0.1764
(2447216.5)				1.763386	5.9814	3.0188	3.9564
A FEV.29 (OH)	Y:	+0.0536	+0.00412	+ 40.4615	+0.20778		+0.0728
				1.897106	5.7464		4.0842
FEV.29 (OH)	X:	+0.2515	+0.00734	+ 96.7012	+0.41702	+0.004333	+0.1777
(2447220.5)				3.388729	1.3473	4.2686	0.9968
A MAR. 4 (OH)	Y:	+0.0710	+0.00279	+ 39.8354	+0.20555		+0.0722
				3.523557	1.0994		1.1340
MAR. 1 (OH)	X:	+0.2613	+0.00565	+ 96.5171	+0.39287	+0.003858	+0.1774
(2447221.5)				0.653251	4.8827	5.9898	1.8270
A MAR. 5 (OH)	Y:	+0.0754	+0.00235	+ 39.6787	+0.20448		+0.0722
				0.788543	4.6534		1.9635
MAR. 5 (OH)	X:	+0.2874	+0.00844	+ 95.8263	+0.38839	+0.003827	+0.1759
(2447225.5)				2.278211	0.2755	1.0009	5.1496
A MAR. 9 (OH)	Y:	+0.0863	+0.00350	+ 39.0671	+0.20252		+0.0715
				2.414717	0.0072		5.2909
MAR. 9 (OH)	X:	+0.3194	+0.00744	+ 95.1939	+0.39290	+0.001721	+0.1765
(2447229.5)				3.902922	1.9656	1.7039	2.1865
A MAR.13 (OH)	Y:	+0.0990	+0.00317	+ 38.4675	+0.20015		+0.0710
				4.040680	1.6414		2.3223
MAR.13 (OH)	X:	+0.3452	+0.01010	+ 94.6340	+0.40201	+0.001279	+0.1762
(2447233.5)				5.527338	3.6073	5.5855	5.5145
A MAR.17 (OH)	Y:	+0.1097	+0.00395	+ 37.8819	+0.19873		+0.0704
				5.666488	3.2744		5.6549
MAR.17 (OH)	X:	+0.3762	+0.00789	+ 94.1177	+0.40821	+0.002584	+0.1764
(2447237.5)				0.868306	5.2784	2.1692	2.5469
A MAR.21 (OH)	Y:	+0.1213	+0.00319	+ 37.3057	+0.19599		+0.0700
				1.008902	4.9025		2.6796
MAR.21 (OH)	X:	+0.4070	+0.00681	+ 93.6596	+0.41164	+0.004482	+0.1783
(2447241.5)				2.492190	0.6551	3.8465	5.8690
A MAR.25 (OH)	Y:	+0.1331	+0.00241	+ 36.7383	+0.19181		+0.0691
				2.634392	0.2513		6.0068
MAR.25 (OH)	X:	+0.4315	+0.00547	+ 93.2598	+0.39288	+0.002042	+0.1777
(2447245.5)				4.115709	2.2927	4.2187	2.9002
A MAR.29 (OH)	Y:	+0.1431	+0.00192	+ 36.1852	+0.18842		+0.0686
				4.259734	1.8738		3.0500
MAR.29 (OH)	X:	+0.4613	+0.00230	+ 92.9071	+0.38130	+0.002166	+0.1795
(2447249.5)				5.739198	3.9621	4.3923	6.2157
A AVR. 2 (OH)	Y:	+0.1540	+0.00071	+ 35.6404	+0.18528		+0.0684
				5.885133	3.5037		0.0790
AVR. 1 (OH)	X:	+0.4704	+0.00500	+ 92.6882	+0.39277	+0.002186	+0.1790
(2447252.5)				3.815263	2.0532	4.1622	2.4242
A AVR. 5 (OH)	Y:	+0.1573	+0.00165	+ 35.2405	+0.18317		+0.0676
				3.962557	1.5810		2.5786
AVR. 5 (OH)	X:	+0.4977	+0.00161	+ 92.4299	+0.37795	+0.002470	+0.1816
(2447256.5)				5.438511	3.7207	4.0815	5.7393
A AVR. 9 (OH)	Y:	+0.1669	+0.00037	+ 34.7133	+0.17987		+0.0677
				5.587919	3.2075		5.8892

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 1 DE JUPITER: IO N=3.5516

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
AVR. 9 (OH)	X:	+0.5090	+0.00354	+ 92.2321	+0.38057	+0.002871	+0.1814
(2447260.5)				0.778666	5.3702	6.0510	2.7746
A AVR.13 (OH)	Y:	+0.1707	+0.00117	+ 34.1960	+0.17731		+0.0667
				0.930205	4.8395		2.9291
AVR.13 (OH)	X:	+0.5283	+0.00105	+ 92.0806	+0.37993	+0.002937	+0.1825
(2447264.5)				2.401894	0.7529	1.1890	6.0858
A AVR.17 (OH)	Y:	+0.1770	+0.00028	+ 33.6878	+0.17409		+0.0664
				2.555655	0.1829		6.2420
AVR.17 (OH)	X:	+0.5353	+0.00441	+ 91.9811	+0.38720	+0.000888	+0.1843
(2447268.5)				4.025116	2.4265	1.4329	3.1270
A AVR.21 (OH)	Y:	+0.1789	+0.00146	+ 33.1892	+0.17063		+0.0659
				4.181158	1.8035		3.2862
AVR.21 (OH)	X:	+0.5470	+0.00311	+ 91.9466	+0.39879	+0.002581	+0.1852
(2447272.5)				5.648382	4.0599	0.5908	0.1556
A AVR.25 (OH)	Y:	+0.1825	+0.00097	+ 32.7002	+0.16792		+0.0658
				5.806826	3.4264		0.3156
AVR.25 (OH)	X:	+0.5570	+0.00364	+ 91.9490	+0.40116	+0.003413	+0.1875
(2447276.5)				0.988389	5.7229	2.4976	3.4744
A AVR.29 (OH)	Y:	+0.1844	+0.00107	+ 32.2187	+0.16394		+0.0649
				1.149333	5.0421		3.6245
AVR.29 (OH)	X:	+0.5635	+0.00223	+ 92.0035	+0.39276	+0.002277	+0.1887
(2447280.5)				2.611510	1.0944	3.8624	0.5016
A MAI 3 (OH)	Y:	+0.1857	+0.00044	+ 31.7434	+0.15931		-+0.0642
				2.775232	0.3825		0.6670
MAI 1 (OH)	X:	+0.5675	+0.00132	+ 92.0480	+0.38043	+0.001979	+0.1892
(2447282.5)				3.423097	1.9361	1.6137	2.1644
A MAI 5 (OH)	Y:	+0.1870	+0.00031	+ 31.5104	+0.15835		+0.0642
				3.588296	1.1945		2.3306
MAI 5 (OH)	X:	+0.5709	+0.00065	+ 92.1856	+0.39857	+0.002780	+0.1907
(2447286.5)				5.046585	3.5719	0.1370	5.4736
A MAI 9 (OH)	Y:	+0.1875	+0.00002	+ 31.0494	+0.15509		+0.0642
				5.214536	2.8140		5.6439
MAI 9 (OH)	X:	+0.5702	+0.00204	+ 92.3646	+0.39783	+0.002950	+0.1935
(2447290.5)				0.386784	5.2277	1.7985	2.5079
A MAI 13 (OH)	Y:	+0.1859	+0.00047	+ 30.5963	+0.15176		+0.0638
				0.557751	4.4303		2.6692
MAI 13 (OH)	X:	+0.5701	+0.00027	+ 92.5907	+0.39113	+0.001917	+0.1950
(2447294.5)				2.010214	0.6052	3.3108	5.8182
A MAI 17 (OH)	Y:	+0.1842	-0.00016	+ 30.1473	+0.14625		+0.0626
				2.184329	6.0475		5.9941
MAI 17 (OH)	X:	+0.5699	-0.00059	+ 92.8767	+0.38396	+0.003035	+0.1977
(2447298.5)				3.633816	2.2396	3.9232	2.8469
A MAI 21 (OH)	Y:	+0.1837	-0.00070	+ 29.7106	+0.14286		+0.0629
				3.811247	1.3782		3.0319
MAI 21 (OH)	X:	+0.5653	-0.00304	+ 93.1982	+0.37512	+0.002241	+0.1997
(2447302.5)				5.257566	3.9241	3.9671	6.1611
A MAI 25 (OH)	Y:	+0.1810	-0.00123	+ 29.2792	+0.13904		+0.0621
				5.438481	2.9965		0.0598
MAI 25 (OH)	X:	+0.5613	-0.00443	+ 93.5697	+0.37593	+0.003083	+0.2020
(2447306.5)				0.598410	5.5927	5.2865	3.1861
A MAI 29 (OH)	Y:	+0.1787	-0.00170	+ 28.8553	+0.13518		+0.0618
				0.782892	4.6205		3.3746

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 1 DE JUPITER: IO N=3.5516

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
MAI 29 (0H)	X:	+0.5460	-0.00418	+ 93.9960	+0.38037	+0.002235	+0.2038
(2447310.5)				2.222648	0.9558	1.0456	0.2205
A JUN. 2 (0H)	Y:	+0.1728	-0.00141	+ 28.4407	+0.13134		+0.0611
				2.410788	6.2381		0.4112
JUN. 1 (0H)	X:	+0.5412	-0.00518	+ 94.3442	+0.37532	+0.003462	+0.2060
(2447313.5)				0.299276	5.3533	5.0026	2.7007
A JUN. 5 (0H)	Y:	+0.1708	-0.00188	+ 28.1346	+0.12815		+0.0609
				0.490325	4.3063		2.8966
JUN. 5 (0H)	X:	+0.5224	-0.00523	+ 94.8548	+0.38161	+0.002115	+0.2082
(2447317.5)				1.923915	0.7157	0.7472	6.0198
A JUN. 9 (0H)	Y:	+0.1640	-0.00165	+ 27.7342	+0.12413		+0.0603
				2.118865	5.9231		6.2175
JUN. 9 (0H)	X:	+0.5097	-0.00666	+ 95.4143	+0.39196	+0.000722	+0.2114
(2447321.5)				3.548801	2.3706	5.7850	3.0459
A JUN.13 (0H)	Y:	+0.1594	-0.00204	+ 27.3441	+0.12068		+0.0600
				3.747788	1.2491		3.2527
JUN.13 (0H)	X:	+0.4811	-0.00313	+ 96.0272	+0.40213	+0.003803	+0.2137
(2447325.5)				5.174006	4.0011	0.2148	0.0815
A JUN.17 (0H)	Y:	+0.1512	-0.00100	+ 26.9605	+0.11610		+0.0597
				5.377158	2.8665		0.2810
JUN.17 (0H)	X:	+0.4650	-0.00565	+ 96.6826	+0.39793	+0.003657	+0.2163
(2447329.5)				0.516147	5.6587	1.5610	3.3900
A JUN.21 (0H)	Y:	+0.1452	-0.00153	+ 26.5879	+0.11178		+0.0584
				0.723733	4.4772		3.5909
JUN.21 (0H)	X:	+0.4364	-0.00279	+ 97.3821	+0.39461	+0.002370	+0.2204
(2447333.5)				2.141754	1.0560	3.4612	0.4216
A JUN.25 (0H)	Y:	+0.1366	-0.00094	+ 26.2230	+0.10590		+0.0585
				2.353929	6.0868		0.6404
JUN.25 (0H)	X:	+0.4169	-0.00639	+ 98.1418	+0.38343	+0.002183	+0.2219
(2447337.5)				3.767728	2.7154	3.6883	3.7333
A JUN.29 (0H)	Y:	+0.1311	-0.00187	+ 25.8722	+0.10195		+0.0581
				3.984706	1.4174		3.9534
JUN.29 (0H)	X:	+0.3936	-0.00752	+ 98.9392	+0.37539	+0.004468	+0.2257
(2447341.5)				5.394053	4.4114	4.0279	0.7581
A JUL. 3 (0H)	Y:	+0.1248	-0.00217	+ 25.5303	+0.09707		+0.0574
				5.615984	3.0367		0.9837
JUL. 1 (0H)	X:	+0.3768	-0.00778	+ 99.3650	+0.40226	+0.004269	+0.2261
(2447343.5)				6.207654	5.1854	1.1073	2.4208
A JUL. 5 (0H)	Y:	+0.1204	-0.00189	+ 25.3653	+0.09534		+0.0570
				0.148703	3.8494		2.6383
JUL. 5 (0H)	X:	+0.3401	-0.00440	+100.2401	+0.39535	+0.002560	+0.2301
(2447347.5)				1.551329	0.5819	2.5591	5.7353
A JUL. 9 (0H)	Y:	+0.1103	-0.00105	+ 25.0424	+0.08945		+0.0566
				1.780615	5.4485		5.9741
JUL. 9 (0H)	X:	+0.3136	-0.00735	+101.1674	+0.39015	+0.002031	+0.2326
(2447351.5)				3.178659	2.2547	3.6156	2.7643
A JUL.13 (0H)	Y:	+0.1037	-0.00183	+ 24.7340	+0.08441		+0.0565
				3.413245	0.7837		3.0035
JUL.13 (0H)	X:	+0.2833	-0.00802	+102.1440	+0.37749	+0.004537	+0.2371
(2447355.5)				4.806382	3.9505	3.6912	6.0751
A JUL.17 (0H)	Y:	+0.0968	-0.00206	+ 24.4401	+0.07928		+0.0559
				5.046411	2.4023		0.0317

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DU SATELLITE 1 DE JUPITER: IO N=3.5516

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
JUL.17 (OH)	X:	+0.2506	-0.01031	+103.1645	+0.39086	+0.002397	+0.2385
(2447359.5)				0.151604	5.6142	5.1250	3.1091
A JUL.21 (OH)	Y:	+0.0892	-0.00233	+ 24.1611	+0.07341		+0.0552
				0.397029	4.0314		3.3599
JUL.21 (OH)	X:	+0.2185	-0.01201	+104.2409	+0.40302	+0.001425	+0.2425
(2447363.5)				1.780495	0.9752	2.9512	0.1370
A JUL.25 (OH)	Y:	+0.0817	-0.00266	+ 23.9011	+0.06758		+0.0550
				2.031329	5.6461		0.3964
JUL.25 (OH)	X:	+0.1762	-0.01092	+105.3679	+0.40360	+0.001255	+0.2463
(2447367.5)				3.409749	2.6527	5.5967	3.4594
A JUL.29 (OH)	Y:	+0.0722	-0.00215	+ 23.6606	+0.06221		+0.0549
				3.666218	0.9779		3.7207
JUL.29 (OH)	X:	+0.1383	-0.01084	+106.5470	+0.40903	+0.004921	+0.2486
(2447371.5)				5.039689	4.2845	0.1398	0.4888
A AOU. 2 (OH)	Y:	+0.0652	-0.00223	+ 23.4380	+0.05536		+0.0540
				5.301657	2.5934		0.7441
AOU. 1 (OH)	X:	+0.1101	-0.01204	+107.4541	+0.40217	+0.000607	+0.2520
(2447374.5)				3.120727	2.4363	4.7453	2.9801
A AOU. 5 (OH)	Y:	+0.0584	-0.00225	+ 23.2862	+0.05072		+0.0542
				3.387063	0.6752		3.2488
AOU. 5 (OH)	X:	+0.0696	-0.01148	+108.7134	+0.41060	+0.005093	+0.2544
(2447378.5)				4.751685	4.0721	6.1824	0.0101
A AOU. 9 (OH)	Y:	+0.0513	-0.00228	+ 23.1030	+0.04358		+0.0535
				5.023497	2.2899		0.2727
AOU. 9 (OH)	X:	+0.0216	-0.00874	+110.0175	+0.40806	+0.006953	+0.2597
(2447382.5)				0.099940	5.7352	1.3102	3.3304
A AOU.13 (OH)	Y:	+0.0419	-0.00140	+ 22.9445	+0.03603		+0.0531
				0.377363	3.9312		3.6074
AOU.13 (OH)	X:	-0.0178	-0.00923	+111.3589	+0.39982	+0.002423	+0.2621
(2447386.5)				1.731844	1.1847	2.6500	0.3620
A AOU.17 (OH)	Y:	+0.0339	-0.00155	+ 22.8121	+0.02743		+0.0536
				2.014788	5.5236		0.6550
AOU.17 (OH)	X:	-0.0631	-0.00695	+112.7514	+0.39466	+0.002346	+0.2662
(2447390.5)				3.364605	2.8742	3.6393	3.6788
A AOU.21 (OH)	Y:	+0.0256	-0.00128	+ 22.7094	+0.01943		+0.0533
				3.652971	0.9307		3.9636
AOU.21 (OH)	X:	-0.0974	-0.01150	+114.1786	+0.39437	+0.002540	+0.2685
(2447394.5)				4.998074	4.5803	4.0055	0.7145
A AOU.25 (OH)	Y:	+0.0198	-0.00218	+ 22.6375	+0.01131		+0.0523
				5.291551	2.6417		1.0095
AOU.25 (OH)	X:	-0.1399	-0.01042	+115.6337	+0.40756	+0.001769	+0.2720
(2447398.5)				0.349156	6.2650	4.3714	4.0336
A AOU.29 (OH)	Y:	+0.0130	-0.00203	+ 22.5969	+0.00388		+0.0529
				0.647497	5.1437		4.3392
AOU.29 (OH)	X:	-0.1793	-0.01400	+117.1394	+0.40435	+0.002480	+0.2755
(2447402.5)				1.984192	1.6314	3.1699	1.0741
A SEP. 2 (OH)	Y:	+0.0052	-0.00236	+ 22.5925	+0.00805		+0.0534
				2.286939	2.1451		1.3821
SEP. 1 (OH)	X:	-0.2154	-0.00966	+118.2753	+0.40584	+0.001950	+0.2783
(2447405.5)				0.069223	6.0854	4.3579	3.5603
A SEP. 5 (OH)	Y:	-0.0001	-0.00192	+ 22.6110	+0.01565		+0.0531
				0.375252	0.3772		3.8760

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DU SATELLITE 1 DE JUPITER: IO N=3.5516

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
SEP. 5 (OH)	X:	-0.2533	-0.01387	+119.8246	+0.40574	+0.002765	+0.2817
(2447409.5)				1.705644	1.4547	3.2364	0.6033
A SEP. 9 (OH)	Y:	-0.0075	-0.00238	+ 22.6721	+0.02532		+0.0536
				2.015366	2.1096		0.9204
SEP. 9 (OH)	X:	-0.2947	-0.01248	+121.3973	+0.40332	+0.005509	+0.2849
(2447413.5)				3.342838	3.1282	5.0114	3.9247
A SEP.13 (OH)	Y:	-0.0153	-0.00228	+ 22.7733	+0.03526		+0.0535
				3.655906	3.7584		4.2350
SEP.13 (OH)	X:	-0.3449	-0.01046	+122.9754	+0.40196	+0.009014	+0.2891
(2447417.5)				4.980916	4.7953	0.3358	0.9714
A SEP.17 (OH)	Y:	-0.0234	-0.00185	+ 22.9147	+0.04643		+0.0530
				5.296617	5.4290		1.2804
SEP.17 (OH)	X:	-0.3816	-0.01035	+124.5568	+0.39159	+0.006305	+0.2919
(2447421.5)				0.336457	0.2531	1.7215	4.2896
A SEP.21 (OH)	Y:	-0.0301	-0.00182	+ 23.0998	+0.05771		+0.0538
				0.654495	0.7785		4.6172
SEP.21 (OH)	X:	-0.4330	-0.00545	+126.1307	+0.39255	+0.001796	+0.2962
(2447425.5)				1.976022	2.0183	3.7292	1.3354
A SEP.25 (OH)	Y:	-0.0403	-0.00092	+ 23.3283	+0.06917		+0.0554
				2.295645	2.4405		1.6529
SEP.25 (OH)	X:	-0.4630	-0.00879	+127.6969	+0.38602	+0.001417	+0.2972
(2447429.5)				3.616680	3.7283	5.0118	4.6631
A SEP.29 (OH)	Y:	-0.0468	-0.00187	+ 23.6025	+0.08020		+0.0547
				3.937270	4.0576		4.9773
SEP.29 (OH)	X:	-0.5042	-0.00689	+129.2291	+0.38903	+0.001560	+0.3009
(2447433.5)				5.258142	5.4632	3.1979	1.7025
A OCT. 3 (OH)	Y:	-0.0541	-0.00170	+ 23.9200	+0.09168		+0.0552
				5.578907	5.7003		2.0327
OCT. 1 (OH)	X:	-0.5156	-0.01011	+129.9876	+0.37992	+0.007833	+0.3024
(2447435.5)				6.079353	6.2397	1.4981	3.3701
A OCT. 5 (OH)	Y:	-0.0565	-0.00212	+ 24.0959	+0.09740		+0.0558
				0.116665	0.2349		3.6958
OCT. 5 (OH)	X:	-0.5640	-0.00515	+131.4732	+0.37550	+0.002517	+0.3054
(2447439.5)				1.438762	1.7518	3.1180	0.4173
A OCT. 9 (OH)	Y:	-0.0674	-0.00109	+ 24.4822	+0.10759		+0.0577
				1.758469	1.8915		0.7407
OCT. 9 (OH)	X:	-0.5909	-0.00685	+132.8948	+0.37533	+0.003118	+0.3059
(2447443.5)				3.082445	3.4761	5.4419	3.7457
A OCT.13 (OH)	Y:	-0.0746	-0.00181	+ 24.9092	+0.11822		+0.0574
				3.400677	3.5268		4.0554
OCT.13 (OH)	X:	-0.6280	-0.00463	+134.2471	+0.37454	+0.002630	+0.3088
(2447447.5)				4.726913	5.2327	2.1269	0.7907
A OCT.17 (OH)	Y:	-0.0832	-0.00164	+ 25.3784	+0.12694		+0.0582
				5.043004	5.1663		1.1081
OCT.17 (OH)	X:	-0.6504	-0.00841	+135.5101	+0.37330	+0.004612	+0.3090
(2447451.5)				0.089042	0.6643	3.3420	4.1269
A OCT.21 (OH)	Y:	-0.0894	-0.00250	+ 25.8817	+0.13583		+0.0597
				0.402343	0.5250		4.4421
OCT.21 (OH)	X:	-0.6779	-0.00826	+136.6890	+0.34687	+0.007855	+0.3104
(2447455.5)				1.735209	2.3553	3.9335	1.1714
A OCT.25 (OH)	Y:	-0.0979	-0.00255	+ 26.4201	+0.14205		+0.0608
				2.044988	2.1774		1.4832

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DU SATELLITE 1 DE JUPITER: IO N=3.5516

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
OCT.25 (OH)	X:	-0.7047	-0.00956	+137.7493	+0.34079	+0.008147	+0.3116
(2447459.5)				3.381885	4.1159	5.7545	4.5122
A OCT.29 (OH)	Y:	-0.1069	-0.00271	+ 26.9850	+0.14654		+0.0619
				3.687848	3.8276		4.8136
OCT.29 (OH)	X:	-0.7311	-0.00745	+138.6808	+0.33056	+0.008131	+0.3117
(2447463.5)				5.029195	5.8826	1.0085	1.5620
A NOV. 2 (OH)	Y:	-0.1149	-0.00252	+ 27.5672	+0.15098		+0.0622
				5.330864	5.4837		1.8587
NOV. 1 (OH)	X:	-0.7462	-0.00895	+139.2939	+0.32858	+0.007564	+0.3128
(2447466.5)				3.123476	4.0752	5.6347	4.0652
A NOV. 5 (OH)	Y:	-0.1217	-0.00281	+ 28.0164	+0.15146		+0.0638
				3.421741	3.5793		4.3619
NOV. 5 (OH)	X:	-0.7700	-0.00623	+139.9738	+0.31873	+0.007729	+0.3117
(2447470.5)				4.771725	5.8506	0.8704	1.1142
A NOV. 9 (OH)	Y:	-0.1301	-0.00246	+ 28.6170	+0.15214		+0.0642
				5.065123	5.2376		1.4009
NOV. 9 (OH)	X:	-0.7940	-0.00464	+140.5010	+0.31205	+0.006620	+0.3128
(2447474.5)				0.137152	1.3772	2.2376	4.4509
A NOV.13 (OH)	Y:	-0.1406	-0.00184	+ 29.2184	+0.14982		+0.0651
				0.425506	0.6145		4.7389
NOV.13 (OH)	X:	-0.8106	-0.00216	+140.8534	+0.33731	+0.005487	+0.3101
(2447478.5)				1.785956	3.1656	5.1761	1.5076
A NOV.17 (OH)	Y:	-0.1486	-0.00175	+ 29.8079	+0.14521		+0.0659
				2.069223	2.2769		1.7898
NOV.17 (OH)	X:	-0.8318	+0.00082	+141.0283	+0.34238	+0.007378	+0.3098
(2447482.5)				3.435107	4.9362	0.9610	4.8423
A NOV.21 (OH)	Y:	-0.1578	-0.00105	+ 30.3763	+0.13829		+0.0672
				3.713112	3.9357		5.1235
NOV.21 (OH)	X:	-0.8326	-0.00194	+141.0296	+0.33967	+0.007444	+0.3058
(2447486.5)				5.084332	0.4288	2.6683	1.8979
A NOV.25 (OH)	Y:	-0.1641	-0.00178	+ 30.9155	+0.12881		+0.0683
				5.357119	5.5898		2.1638
NOV.25 (OH)	X:	-0.8461	+0.00059	+140.8551	+0.32934	+0.008708	+0.3041
(2447490.5)				0.450346	2.1891	3.9139	5.2357
A NOV.29 (OH)	Y:	-0.1724	-0.00149	+ 31.4159	+0.11765		+0.0680
				0.717802	0.9847		5.4938
NOV.29 (OH)	X:	-0.8397	-0.00513	+140.5222	+0.31812	+0.005306	+0.3005
(2447494.5)				2.099466	4.0313	5.0849	2.2962
A DEC. 3 (OH)	Y:	-0.1760	-0.00269	+ 31.8719	+0.10340		+0.0684
				2.361797	2.6459		2.5679
DEC. 1 (OH)	X:	-0.8602	+0.00301	+140.2727	+0.34936	+0.008881	+0.3005
(2447496.5)				2.923653	4.8658	0.6107	3.9577
A DEC. 5 (OH)	Y:	-0.1826	-0.00059	+ 32.0778	+0.09696		+0.0692
				3.183570	3.5043		4.2247
DEC. 5 (OH)	X:	-0.8530	+0.00060	+139.6737	+0.35068	+0.008183	+0.2953
(2447500.5)				4.572260	0.3695	2.4051	1.0131
A DEC. 9 (OH)	Y:	-0.1874	-0.00108	+ 32.4460	+0.08196		+0.0702
				4.827384	5.1658		1.2691
DEC. 9 (OH)	X:	-0.8589	+0.00410	+138.9124	+0.34827	+0.008225	+0.2914
(2447504.5)				6.220411	2.1375	3.8945	4.3493
A DEC.13 (OH)	Y:	-0.1946	-0.00046	+ 32.7544	+0.06453		+0.0690
				0.187607	0.5991		4.5877

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DU SATELLITE 1 DE JUPITER: IO N=3.5516

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
DEC.13 (0H)	X:	-0.8424	-0.00215	+138.0067	+0.33872	+0.005081	+0.2869
(2447508.5)				1.584933	3.9547	4.8629	1.4083
A DEC.17 (0H)	Y:	-0.1952	-0.00201	+ 32.9917	+0.04746		+0.0681
				1.830868	2.3091		1.6602
DEC.17 (0H)	X:	-0.8421	+0.00116	+136.9660	+0.34833	+0.003288	+0.2827
(2447512.5)				3.231880	5.7400	6.2575	4.7452
A DEC.21 (0H)	Y:	-0.1988	-0.00104	+ 33.1610	+0.02968		+0.0696
				3.473601	4.1781		4.9885
DEC.21 (0H)	X:	-0.8329	-0.00075	+135.7944	+0.35303	+0.003932	+0.2796
(2447516.5)				4.878048	1.2024	1.5330	1.8017
A DEC.25 (0H)	Y:	-0.2023	-0.00097	+ 33.2527	+0.01645		+0.0695
				5.115972	0.0354		2.0258
DEC.25 (0H)	X:	-0.8256	+0.00249	+134.5278	+0.37513	+0.003176	+0.2738
(2447520.5)				0.240159	2.9181	4.4881	5.1334
A DEC.29 (0H)	Y:	-0.2058	-0.00028	+ 33.2760	+0.01773		+0.0676
				0.474546	2.8226		5.3616
DEC.29 (0H)	X:	-0.8214	+0.00577	+133.1636	+0.38906	+0.009394	+0.2708
(2447524.5)				1.884623	4.6017	0.1390	2.1882
A DEC.33 (0H)	Y:	-0.2072	+0.00056	+ 33.2274	+0.03064		+0.0668
				2.115977	5.0541		2.4282

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DU SATELLITE 2 DE JUPITER: EUROPE N=1.7693

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
JAN. 1 (OH)	X:	-0.3877	+0.76682	+181.8102	+2.07853	+0.359568	+0.9601
(2447161.5)				0.914969	5.1029	2.7028	4.5774
A JAN. 5 (OH)	Y:	+0.7179	-0.03029	+ 80.7813	+0.29615		+0.4162
				1.056921	4.5319		4.6863
JAN. 5 (OH)	X:	+2.1629	-0.52781	+176.9474	+0.54163	+0.228393	+0.9077
(2447165.5)				1.702641	1.6412	5.4836	6.2112
A JAN. 9 (OH)	Y:	+0.6104	-0.01397	+ 79.6143	+0.32075		+0.4060
				1.845387	5.3426		0.0327
JAN. 9 (OH)	X:	+0.7517	+0.02808	+175.6793	+0.64840	+0.068722	+0.8845
(2447169.5)				2.486126	5.5770	1.4605	1.5135
A JAN.13 (OH)	Y:	+0.5526	-0.00764	+ 78.4089	+0.32677		+0.4011
				2.633533	6.1446		1.6459
JAN.13 (OH)	X:	+0.1074	+0.32319	+173.4222	+1.03974	+0.162450	+0.8643
(2447173.5)				3.271036	6.1824	2.9270	3.1481
A JAN.17 (OH)	Y:	+0.4994	-0.01910	+ 77.2155	+0.33874		+0.3931
				3.420803	0.6947		3.2850
JAN.17 (OH)	X:	+1.8006	-0.63493	+172.2969	+1.60557	+0.254783	+0.8601
(2447177.5)				4.065693	2.0780	6.0856	4.7106
A JAN.21 (OH)	Y:	+0.4598	-0.02727	+ 76.0215	+0.34730		+0.3866
				4.207763	1.5244		4.8967
JAN.21 (OH)	X:	-0.7193	+0.56990	+168.0711	+0.60486	+0.269781	+0.8889
(2447181.5)				4.849368	5.2914	2.7528	0.0668
A JAN.25 (OH)	Y:	+0.3720	-0.02169	+ 74.8108	+0.34284		+0.3817
				4.993283	2.3115		0.2439
JAN.25 (OH)	X:	+1.6324	-0.62283	+167.8103	+1.70740	+0.286738	+0.9042
(2447185.5)				5.625332	2.3756	5.5944	1.7272
A JAN.29 (OH)	Y:	+0.2549	+0.00723	+ 73.6392	+0.35857		+0.3789
				5.780005	3.2521		1.8734
JAN.29 (OH)	X:	+0.2345	-0.08601	+165.5220	+0.90107	+0.079233	+0.8628
(2447189.5)				0.133332	3.8850	0.7803	3.3557
A FEV. 2 (OH)	Y:	+0.2368	-0.01303	+ 72.4311	+0.33012		+0.3677
				0.280416	3.9669		3.4944
FEV. 1 (OH)	X:	+0.7703	-0.30629	+164.3059	+1.11315	+0.164186	+0.8716
(2447192.5)				5.429899	2.3363	5.2212	1.4191
A FEV. 5 (OH)	Y:	+0.1559	+0.00057	+ 71.5973	+0.35375		+0.3654
				5.582037	3.0810		1.5741
FEV. 5 (OH)	X:	+0.5150	-0.34495	+162.3387	+1.02641	+0.160999	+0.8518
(2447196.5)				6.213445	3.2383	6.2770	3.0452
A FEV. 9 (OH)	Y:	+0.1115	-0.00593	+ 70.4413	+0.33534		+0.3569
				0.081745	3.8146		3.1921
FEV. 9 (OH)	X:	-1.7964	+0.78020	+161.7842	+2.26072	+0.380811	+0.8531
(2447200.5)				0.723751	5.2394	2.7602	4.7240
A FEV.13 (OH)	Y:	+0.1255	-0.04617	+ 69.2618	+0.30788		+0.3535
				0.865173	4.6586		4.8292
FEV.13 (OH)	X:	+0.8002	-0.56565	+157.7997	+0.58571	+0.243935	+0.7852
(2447204.5)				1.499159	1.8564	5.7711	0.0409
A FEV.17 (OH)	Y:	-0.0175	-0.00125	+ 68.2351	+0.33135		+0.3423
				1.647515	5.3642		0.1565
FEV.17 (OH)	X:	-0.9479	+0.18074	+157.7579	+0.85890	+0.103544	+0.7719
(2447208.5)				2.276502	5.7396	2.2333	1.6395
A FEV.21 (OH)	Y:	-0.0664	-0.01078	+ 67.1554	+0.33077		+0.3360
				2.430093	6.1868		1.7866

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		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
FEV.21 (OH)	X:	-0.4903	-0.04375	+156.2307 3.061433	+0.76779 0.9468	+0.036192 4.4697	+0.7743 3.2299
(2447212.5)							
A FEV.25 (OH)	Y:	-0.1033	-0.01367	+ 66.0935 3.212581	+0.32903 0.7101		+0.3301 3.3936
FEV.25 (OH)	X:	-0.0083	-0.40682	+155.3144 3.844741	+1.27944 2.1116	+0.170403 6.0938	+0.7615 4.8412
(2447216.5)							
A FEV.29 (OH)	Y:	-0.1772	-0.00995	+ 65.0500 3.994142	+0.32532 1.5062		+0.3238 5.0253
FEV.29 (OH)	X:	-2.2232	+0.69078	+152.2040 4.621474	+0.87665 5.3236	+0.334874 2.8637	+0.8027 0.1581
(2447220.5)							
A MAR. 4 (OH)	Y:	-0.1918	-0.02656	+ 64.0540 4.775925	+0.33683 2.3021		+0.3187 0.3522
MAR. 1 (OH)	X:	-1.8462	+0.41458	+153.7969 0.110874	+1.60705 4.8138	+0.220130 2.3468	+0.7845 3.7990
(2447221.5)							
A MAR. 5 (OH)	Y:	-0.1923	-0.03042	+ 63.7367 0.258688	+0.30553 4.1071		+0.3160 3.9198
MAR. 5 (OH)	X:	-0.9798	+0.01286	+152.1378 0.884436	+0.61402 5.5708	+0.061920 4.0144	+0.7553 5.3950
(2447225.5)							
A MAR. 9 (OH)	Y:	-0.2785	-0.01243	+ 62.7717 1.039702	+0.30838 4.8593		+0.3097 5.5288
MAR. 9 (OH)	X:	-0.1959	-0.49482	+150.3693 1.663899	+0.51241 1.7032	+0.210228 5.9869	+0.7372 0.7598
(2447229.5)							
A MAR.13 (OH)	Y:	-0.3524	-0.00285	+ 61.8232 1.820328	+0.31436 5.6243		+0.3031 0.8851
MAR.13 (OH)	X:	-2.2143	+0.49671	+150.9750 2.436367	+1.29438 5.8896	+0.228290 2.7983	+0.7062 2.3155
(2447233.5)							
A MAR.17 (OH)	Y:	-0.3658	-0.01108	+ 60.8587 2.601691	+0.31100 0.1607		+0.2965 2.4855
MAR.17 (OH)	X:	-0.3905	-0.47235	+149.8547 3.226969	+1.42044 1.8327	+0.200577 5.7913	+0.7241 3.9151
(2447237.5)							
A MAR.21 (OH)	Y:	-0.4275	-0.00537	+ 59.9170 3.381951	+0.30436 0.9400		+0.2913 4.1162
MAR.21 (OH)	X:	-2.3332	+0.41587	+147.9597 3.996446	+0.41578 5.0733	+0.219530 2.5134	+0.7564 5.5417
(2447241.5)							
A MAR.25 (OH)	Y:	-0.4112	-0.02921	+ 59.0384 4.162825	+0.32282 1.7241		+0.2881 5.7300
MAR.25 (OH)	X:	-1.6670	+0.10006	+148.0779 4.776832	+0.32797 2.7843	+0.076460 3.6180	+0.7334 0.8961
(2447245.5)							
A MAR.29 (OH)	Y:	-0.5096	+0.00113	+ 58.0868 4.943083	+0.29473 2.5413		+0.2798 1.0788
MAR.29 (OH)	X:	-0.3157	-0.68032	+148.5347 5.549682	+1.58865 2.8041	+0.312487 6.0579	+0.7614 2.5412
(2447249.5)							
A AVR. 2 (OH)	Y:	-0.5485	+0.00804	+ 57.2032 5.724132	+0.30008 3.3897		+0.2767 2.6984
AVR. 1 (OH)	X:	-2.2289	+0.30786	+146.7733 4.567572	+0.16830 4.4679	+0.151200 3.0823	+0.7245 0.5769
(2447252.5)							
A AVR. 5 (OH)	Y:	-0.5560	-0.00129	+ 56.5543 4.737674	+0.28726 2.3295		+0.2696 0.7736
AVR. 5 (OH)	X:	-0.1617	-0.79933	+148.1476 5.339758	+1.86889 2.6329	+0.364821 5.9446	+0.7550 2.2432
(2447256.5)							
A AVR. 9 (OH)	Y:	-0.6069	+0.01448	+ 55.6893 5.518990	+0.29159 3.2056		+0.2672 2.3995

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		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
AVR. 9 (OH)	X:	-2.8074	+0.48761	+146.6816	+1.53354	+0.225907	+0.7018
(2447260.5)				6.131636	4.9815	2.6112	3.8890
A AVR.13 (OH)	Y:	-0.5692	-0.01551	+ 54.8363	+0.26282		+0.2583
				0.014551	3.8634		4.0272
AVR.13 (OH)	X:	-1.3413	-0.21748	+145.9026	+0.25525	+0.101928	+0.6784
(2447264.5)				0.617006	0.0219	5.2370	5.5009
A AVR.17 (OH)	Y:	-0.6004	-0.01158	+ 54.0212	+0.26556		+0.2524
				0.795153	4.6715		5.6544
AVR.17 (OH)	X:	-1.8044	-0.06937	+146.2194	+0.41589	+0.049857	+0.6724
(2447268.5)				1.395582	5.9211	0.5026	0.8032
A AVR.21 (OH)	Y:	-0.6397	+0.00260	+ 53.2328	+0.26852		+0.2474
				1.575439	5.4120		0.9830
AVR.21 (OH)	X:	-2.6375	+0.36919	+146.8071	+1.05373	+0.170187	+0.6542
(2447272.5)				2.170961	6.1197	2.9276	2.4188
A AVR.25 (OH)	Y:	-0.6394	-0.00493	+ 52.4299	+0.26373		+0.2412
				2.356056	6.2202		2.6195
AVR.25 (OH)	X:	-0.7754	-0.61173	+146.0974	+1.62117	+0.270719	+0.6829
(2447276.5)				2.959802	2.0451	6.0274	3.9830
A AVR.29 (OH)	Y:	-0.6482	-0.00166	+ 51.6486	+0.26164		+0.2367
				3.136789	0.7059		4.2294
AVR.29 (OH)	X:	-2.9626	+0.47073	+145.6132	+0.42453	+0.218209	+0.7034
(2447280.5)				3.724060	5.1918	2.6361	5.6525
A MAI 3 (OH)	Y:	-0.6509	-0.00640	+ 50.8845	+0.25806		+0.2337
				3.917323	1.4811		5.8621
MAI 1 (OH)	X:	-1.2502	-0.38753	+145.7614	+0.25784	+0.175356	+0.6505
(2447282.5)				0.973690	1.7116	6.0241	0.2166
A MAI 5 (OH)	Y:	-0.6741	+0.00598	+ 50.5042	+0.25148		+0.2289
				1.165988	4.9864		0.3917
MAI 5 (OH)	X:	-2.9521	+0.47415	+147.5611	+1.30374	+0.210917	+0.6405
(2447286.5)				1.751868	5.8133	2.7458	1.8043
A MAI 9 (OH)	Y:	-0.6588	-0.00252	+ 49.7403	+0.24287		+0.2237
				1.947110	5.7935		2.0271
MAI 9 (OH)	X:	-0.8451	-0.56924	+146.4025	+1.54887	+0.260706	+0.6809
(2447290.5)				2.539297	1.8576	5.8619	3.3847
A MAI 13 (OH)	Y:	-0.6700	+0.00702	+ 49.0045	+0.23929		+0.2201
				2.728207	0.2534		3.6347
MAI 13 (OH)	X:	-2.3656	+0.15441	+147.0584	+0.18952	+0.087362	+0.6784
(2447294.5)				3.307164	2.2324	2.1536	5.0586
A MAI 17 (OH)	Y:	-0.6497	-0.00345	+ 48.2832	+0.23703		+0.2163
				3.509766	1.0570		5.2787
MAI 17 (OH)	X:	-2.4593	+0.29380	+147.4779	+0.09447	+0.161371	+0.6944
(2447298.5)				4.085024	1.2062	3.3489	0.3973
A MAI 21 (OH)	Y:	-0.6593	+0.00512	+ 47.5504	+0.22953		+0.2109
				4.291796	1.8700		0.6199
MAI 21 (OH)	X:	-1.0831	-0.44973	+149.1553	+1.27476	+0.209034	+0.6864
(2447302.5)				4.864325	2.7872	5.9780	2.0566
A MAI 25 (OH)	Y:	-0.6609	+0.01299	+ 46.8424	+0.21445		+0.2076
				5.073580	2.6416		2.2482
MAI 25 (OH)	X:	-3.1678	+0.60317	+148.3137	+1.73537	+0.266985	+0.6611
(2447306.5)				5.651928	4.9585	2.5728	3.7310
A MAI 29 (OH)	Y:	-0.6023	-0.00734	+ 46.1453	+0.20152		+0.2012
				5.854969	3.3469		3.8987

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		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
MAI 29 (OH)	X:	-1.2557	-0.29799	+149.2909	+0.05774	+0.137746	+0.6368
(2447310.5)				0.134749	2.4429	5.6899	5.2895
A JUN. 2 (OH)	Y:	-0.6155	+0.00316	+ 45.4943	+0.20552		+0.1974
				0.354814	4.1264		5.5068
JUN. 1 (OH)	X:	-2.8715	+0.48326	+149.5143	+1.49599	+0.212443	+0.6576
(2447313.5)				5.441484	4.7940	2.4530	3.4270
A JUN. 5 (OH)	Y:	-0.5868	-0.00143	+ 44.9780	+0.19457		+0.1938
				5.654047	3.1355		3.6083
JUN. 5 (OH)	X:	-1.4627	-0.14504	+150.8008	+0.23143	+0.076422	+0.6438
(2447317.5)				6.211485	5.0637	5.4252	4.9962
A JUN. 9 (OH)	Y:	-0.5827	+0.00222	+ 44.3394	+0.19247		+0.1909
				0.154310	3.8989		5.2206
JUN. 9 (OH)	X:	-1.4795	-0.13813	+151.6829	+0.31203	+0.071825	+0.6422
(2447321.5)				0.708007	5.8509	0.0650	0.3550
A JUN.13 (OH)	Y:	-0.5640	+0.00439	+ 43.7050	+0.18863		+0.1865
				0.937768	4.6660		0.5876
JUN.13 (OH)	X:	-2.2737	+0.33875	+153.3759	+1.07343	+0.139869	+0.6478
(2447325.5)				1.489493	6.1620	3.1005	1.9323
A JUN.17 (OH)	Y:	-0.5569	+0.01104	+ 43.0929	+0.18845		+0.1840
				1.721951	5.4270		2.2048
JUN.17 (OH)	X:	-0.6200	-0.48072	+153.1456	+1.39226	+0.223953	+0.6728
(2447329.5)				2.272916	1.8744	5.9308	3.5576
A JUN.21 (OH)	Y:	-0.5238	+0.00605	+ 42.4724	+0.17611		+0.1803
				2.506249	6.2009		3.8450
JUN.21 (OH)	X:	-2.7869	+0.62363	+154.8684	+0.71080	+0.284886	+0.7074
(2447333.5)				3.039760	5.4254	2.5920	5.2255
A JUN.25 (OH)	Y:	-0.4719	-0.00851	+ 41.9067	+0.18755		+0.1793
				3.292130	0.7746		5.4768
JUN.25 (OH)	X:	-1.1788	-0.07642	+156.4888	+0.77988	+0.069671	+0.6785
(2447337.5)				3.828683	2.3632	4.9238	0.5919
A JUN.29 (OH)	Y:	-0.4889	+0.01191	+ 41.2871	+0.15446		+0.1733
				4.076795	1.4987		0.8394
JUN.29 (OH)	X:	-0.5952	-0.37200	+158.2210	+1.27983	+0.202025	+0.6958
(2447341.5)				4.609421	2.9389	6.0930	2.2412
A JUL. 3 (OH)	Y:	-0.4771	+0.02220	+ 40.7233	+0.14594		+0.1717
				4.863101	2.3468		2.4769
JUL. 1 (OH)	X:	-0.4998	-0.35402	+157.4031	+1.15136	+0.172474	+0.6835
(2447343.5)				1.859384	1.6047	5.7640	3.0004
A JUL. 5 (OH)	Y:	-0.4365	+0.00749	+ 40.4826	+0.15185		+0.1696
				2.113843	5.7365		3.2927
JUL. 5 (OH)	X:	-1.6717	+0.21818	+159.5729	+0.04124	+0.126124	+0.7021
(2447347.5)				2.634675	1.4824	1.9947	4.6479
A JUL. 9 (OH)	Y:	-0.3857	-0.00537	+ 39.9729	+0.15660		+0.1681
				2.901594	0.3433		4.9309
JUL. 9 (OH)	X:	-1.5052	+0.26906	+160.9457	+0.12654	+0.126158	+0.6968
(2447351.5)				3.416536	2.0533	3.1200	0.0063
A JUL.13 (OH)	Y:	-0.3816	+0.00477	+ 39.4444	+0.13334		+0.1633
				3.687966	1.0380		0.2854
JUL.13 (OH)	X:	+0.3679	-0.62555	+163.8557	+1.83034	+0.312683	+0.7188
(2447355.5)				4.204550	2.5492	5.8521	1.6915
A JUL.17 (OH)	Y:	-0.3936	+0.02675	+ 38.9319	+0.11222		+0.1630
				4.476192	1.9239		1.9392

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		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
JUL.17 (0H)	X:	-1.5756	+0.38963	+163.4801	+1.16951	+0.157574	+0.6752
(2447359.5)				4.985344	4.7768	2.6608	3.3076
A JUL.21 (0H)	Y:	-0.3229	+0.00425	+ 38.5106	+0.11358		+0.1586
				5.263692	2.5297		3.5705
JUL.21 (0H)	X:	-0.3280	-0.13050	+165.9682	+0.28531	+0.071157	+0.6789
(2447363.5)				5.763296	4.8766	5.5465	4.9315
A JUL.25 (0H)	Y:	-0.2893	+0.00404	+ 38.0860	+0.10510		+0.1570
				6.052304	3.2863		5.2239
JUL.25 (0H)	X:	-0.9351	+0.19025	+167.9028	+0.95902	+0.079570	+0.6958
(2447367.5)				0.267724	5.5569	2.4206	0.2407
A JUL.29 (0H)	Y:	-0.2728	+0.00598	+ 37.6952	+0.09725		+0.1552
				0.558944	4.0783		0.5597
JUL.29 (0H)	X:	-0.8523	+0.27458	+169.9444	+0.99855	+0.116022	+0.6950
(2447371.5)				1.050668	6.2362	3.1129	1.8881
A AOU. 2 (0H)	Y:	-0.2396	+0.00641	+ 37.3356	+0.09039		+0.1535
				1.348660	4.8321		2.2189
AOU. 1 (0H)	X:	-0.3496	+0.01806	+171.0920	+0.64083	+0.031927	+0.7036
(2447374.5)				0.066794	5.5003	1.1861	6.2597
A AOU. 5 (0H)	Y:	-0.2233	+0.00565	+ 37.0807	+0.07890		+0.1526
				0.370904	3.8490		0.2974
AOU. 5 (0H)	X:	-0.8635	+0.40083	+173.5796	+1.21849	+0.169670	+0.7068
(2447378.5)				0.853709	5.9915	2.9449	1.6068
A AOU. 9 (0H)	Y:	-0.1900	+0.00554	+ 36.7834	+0.07076		+0.1513
				1.161622	4.6129		1.9548
AOU. 9 (0H)	X:	+1.3541	-0.67592	+173.6861	+1.77942	+0.336100	+0.7641
(2447382.5)				1.637921	1.9559	5.9592	3.2215
A AOU.13 (0H)	Y:	-0.1789	+0.01284	+ 36.5340	+0.06616		+0.1504
				1.953397	5.4356		3.5832
AOU.13 (0H)	X:	-0.6896	+0.40767	+177.6552	+0.26801	+0.185813	+0.7654
(2447386.5)				2.417786	5.5478	2.4782	4.9181
A AOU.17 (0H)	Y:	-0.1135	-0.00746	+ 36.3083	+0.04991		+0.1504
				2.745834	0.1455		5.2453
AOU.17 (0H)	X:	+0.1870	+0.13063	+179.7257	+0.51986	+0.110203	+0.7752
(2447390.5)				3.208865	1.9875	3.8624	0.2833
A AOU.21 (0H)	Y:	-0.1203	+0.00765	+ 36.1230	+0.03251		+0.1484
				3.538086	1.0192		0.6113
AOU.21 (0H)	X:	+1.0072	-0.28103	+182.1719	+1.08760	+0.148339	+0.7716
(2447394.5)				3.998253	2.9791	6.0321	1.9332
A AOU.25 (0H)	Y:	-0.1003	+0.01056	+ 35.9902	+0.01116		+0.1491
				4.330674	1.7314		2.2550
AOU.25 (0H)	X:	-0.4372	+0.53133	+183.0486	+1.51061	+0.207144	+0.7630
(2447398.5)				4.785520	4.9120	2.6105	3.6028
A AOU.29 (0H)	Y:	-0.0619	+0.00813	+ 35.9335	+0.00259		+0.1486
				5.123643	2.8845		3.9140
AOU.29 (0H)	X:	+1.6069	-0.42075	+186.9436	+0.27148	+0.196983	+0.7505
(2447402.5)				5.568512	2.6539	5.9506	5.1774
A SEP. 2 (0H)	Y:	-0.0415	+0.00767	+ 35.9206	+0.01218		+0.1488
				5.917605	5.9805		5.5399
SEP. 1 (0H)	X:	-0.1874	+0.53012	+187.1943	+1.50837	+0.203698	+0.7809
(2447405.5)				4.594659	4.8291	2.5282	3.3369
A SEP. 5 (0H)	Y:	-0.0209	+0.01035	+ 35.9429	+0.02605		+0.1494
				4.942146	4.9837		3.6556

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DU SATELLITE 2 DE JUPITER: EUROPE N=1.7693

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
SEP. 5 (0H)	X:	+1.8332	-0.39245	+191.3099	+0.25065	+0.186098	+0.7754
(2447409.5)				5.380457	2.7651	5.8975	4.9099
A SEP. 9 (0H)	Y:	+0.0023	+0.00848	+ 36.0348	+0.04080		+0.1503
				5.736587	5.8451		5.2813
SEP. 9 (0H)	X:	+0.7860	+0.19653	+193.3372	+0.94401	+0.090852	+0.8087
(2447413.5)				6.176622	5.6376	2.3242	0.2826
A SEP.13 (0H)	Y:	+0.0414	+0.00532	+ 36.1928	+0.05431		+0.1521
				0.247515	0.4201		0.6563
SEP.13 (0H)	X:	+1.2319	+0.11513	+195.5803	+0.99795	+0.103120	+0.8382
(2447417.5)				0.684069	0.6125	4.1444	1.9019
A SEP.17 (0H)	Y:	+0.0336	+0.02023	+ 36.4414	+0.05852		+0.1544
				1.042642	1.1032		2.2921
SEP.17 (0H)	X:	+2.5333	-0.53883	+197.1872	+1.57438	+0.258985	+0.8640
(2447421.5)				1.475296	2.0690	6.0574	3.5512
A SEP.21 (0H)	Y:	+0.0968	+0.00455	+ 36.7059	+0.08638		+0.1544
				1.837433	1.9397		3.9462
SEP.21 (0H)	X:	-0.4448	+1.02360	+202.1882	+1.50285	+0.462878	+0.9261
(2447425.5)				2.261838	5.3143	2.6731	5.2433
A SEP.25 (0H)	Y:	+0.1534	-0.01232	+ 37.0710	+0.11125		+0.1598
				2.634048	2.4868		5.5974
SEP.25 (0H)	X:	+2.5070	-0.32610	+203.4768	+1.18363	+0.171147	+0.8820
(2447429.5)				3.067753	2.4184	5.4516	0.6221
A SEP.29 (0H)	Y:	+0.1440	+0.00341	+ 37.4827	+0.12880		+0.1595
				3.427819	3.5126		0.9633
SEP.29 (0H)	X:	+2.0838	-0.11892	+205.7208	+0.93199	+0.115630	+0.8963
(2447433.5)				3.860563	3.5453	0.1294	2.2747
A OCT. 3 (0H)	Y:	+0.1476	+0.01763	+ 37.9697	+0.15551		+0.1638
				4.223305	4.2903		2.6170
OCT. 1 (0H)	X:	+3.4336	-0.72092	+205.4779	+1.98219	+0.339510	+0.9277
(2447435.5)				1.112629	2.0034	5.8806	3.0329
A OCT. 5 (0H)	Y:	+0.1782	+0.01215	+ 38.2873	+0.14279		+0.1647
				1.478937	1.5859		3.4225
OCT. 5 (0H)	X:	+0.5300	+0.72458	+210.6399	+1.05578	+0.340189	+0.9624
(2447439.5)				1.907594	5.0315	2.4237	4.7294
A OCT. 9 (0H)	Y:	+0.2474	-0.00895	+ 38.8812	+0.17434		+0.1700
				2.276081	2.2273		5.0849
OCT. 9 (0H)	X:	+2.1967	+0.06736	+211.7475	+0.37285	+0.094266	+0.9405
(2447443.5)				2.709821	2.4769	4.0222	0.0935
A OCT.13 (0H)	Y:	+0.2560	-0.00139	+ 39.5556	+0.18659		+0.1718
				3.070564	3.1315		0.4391
OCT.13 (0H)	X:	+3.5531	-0.61813	+214.2074	+1.50516	+0.319431	+0.9676
(2447447.5)				3.513439	2.7248	5.9423	1.7730
A OCT.17 (0H)	Y:	+0.2436	+0.02022	+ 40.2660	+0.21527		+0.1778
				3.866196	3.9498		2.0979
OCT.17 (0H)	X:	+1.3241	+0.56714	+214.6296	+1.63515	+0.230773	+0.9230
(2447451.5)				4.305169	5.2058	2.7378	3.4055
A OCT.21 (0H)	Y:	+0.2950	+0.00939	+ 41.0870	+0.21900		+0.1807
				4.661895	4.7714		3.7285
OCT.21 (0H)	X:	+3.6103	-0.51860	+218.5528	+0.58824	+0.232931	+0.9299
(2447455.5)				5.103774	1.8487	5.9487	5.0253
A OCT.25 (0H)	Y:	+0.3358	+0.00859	+ 41.9487	+0.22637		+0.1859
				5.457722	5.5732		5.3876

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DU SATELLITE 2 DE JUPITER: EUROPE N=1.7693

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
OCT.25 (0H)	X:	+1.0799	+0.76738	+218.9475	+1.78642	+0.355218	+0.9848
(2447459.5)				5.914287	5.6615	2.6955	0.3386
A OCT.29 (0H)	Y:	+0.3770	-0.00110	+ 42.8364	+0.23503		+0.1906
				6.253827	0.1334		0.7228
OCT.29 (0H)	X:	+3.1205	-0.13543	+220.3843	+1.06564	+0.111041	+1.0033
(2447463.5)				0.423860	1.4750	4.9972	2.0318
A NOV. 2 (0H)	Y:	+0.3864	+0.01334	+ 43.7932	+0.22898		+0.1974
				0.767220	0.8969		2.3870
NOV. 1 (0H)	X:	+1.5838	+0.57273	+221.3397	+1.40034	+0.277867	+1.0032
(2447466.5)				5.744349	5.6699	2.5871	0.0955
A NOV. 5 (0H)	Y:	+0.4393	-0.00460	+ 44.4739	+0.24315		+0.2002
				6.076721	6.2742		0.4602
NOV. 5 (0H)	X:	+2.6982	+0.14552	+222.6976	+0.77042	+0.110337	+1.0109
(2447470.5)				0.258855	0.9407	3.7482	1.7744
A NOV. 9 (0H)	Y:	+0.4484	+0.00977	+ 45.4557	+0.23463		+0.2065
				0.590654	0.7504		2.1274
NOV. 9 (0H)	X:	+4.7587	-0.97749	+222.0669	+2.53222	+0.474637	+1.0760
(2447474.5)				1.056752	2.4431	6.1143	3.4006
A NOV.13 (0H)	Y:	+0.4564	+0.02176	+ 46.4250	+0.22163		+0.2120
				1.388036	1.5307		3.7572
NOV.13 (0H)	X:	+1.1292	+0.92387	+225.9871	+1.72852	+0.419218	+1.0796
(2447478.5)				1.860417	5.0919	2.7213	5.1136
A NOV.17 (0H)	Y:	+0.5384	-0.00479	+ 47.3315	+0.23402		+0.2187
				2.185548	2.3225		5.4093
NOV.17 (0H)	X:	+4.4644	-0.64094	+224.2576	+1.30415	+0.322338	+1.0515
(2447482.5)				2.674689	2.1962	5.4616	0.5164
A NOV.21 (0H)	Y:	+0.5237	+0.01582	+ 48.2185	+0.22888		+0.2219
				2.982460	3.1748		0.7816
NOV.21 (0H)	X:	+2.8244	+0.08530	+224.1934	+0.83012	+0.071939	+1.0233
(2447486.5)				3.469940	4.8225	1.3951	2.1269
A NOV.25 (0H)	Y:	+0.5620	+0.01302	+ 49.0850	+0.21343		+0.2267
				3.779779	4.0302		2.4098
NOV.25 (0H)	X:	+2.3519	+0.39917	+223.5364	+1.27142	+0.170770	+1.0217
(2447490.5)				4.272613	5.7234	2.8486	3.7919
A NOV.29 (0H)	Y:	+0.6052	+0.00831	+ 49.8958	+0.19208		+0.2310
				4.577287	4.8500		4.0683
NOV.29 (0H)	X:	+4.1748	-0.56819	+224.6878	+1.10490	+0.233433	+1.0076
(2447494.5)				5.075642	1.9079	6.1732	5.3809
A DEC. 3 (0H)	Y:	+0.6559	-0.00872	+ 50.6319	+0.16477		+0.2362
				5.374598	5.7624		5.6961
DEC. 1 (0H)	X:	+3.2267	+0.02986	+223.4689	+0.24682	+0.145852	+1.0749
(2447496.5)				2.339462	5.9899	4.1593	6.2621
A DEC. 5 (0H)	Y:	+0.6335	+0.00661	+ 50.9418	+0.16076		+0.2390
				2.632644	2.8847		0.2409
DEC. 5 (0H)	X:	+3.9865	-0.46377	+222.2663	+0.51168	+0.232494	+1.0512
(2447500.5)				3.144254	2.9815	6.1527	1.6284
A DEC. 9 (0H)	Y:	+0.6409	+0.01642	+ 51.5244	+0.14347		+0.2429
				3.429592	3.8488		1.8779
DEC. 9 (0H)	X:	+1.6498	+0.73617	+219.8784	+1.92390	+0.317032	+1.0141
(2447504.5)				3.938784	5.5507	2.6926	3.2872
A DEC.13 (0H)	Y:	+0.6836	+0.00770	+ 52.0335	+0.11047		+0.2447
				4.227091	4.6853		3.5323

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DU SATELLITE 2 DE JUPITER: EUROPE N=1.7693

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
DEC.13 (0H)	X:	+4.7415	-0.82770	+221.3415	+1.74801	+0.343904	+0.9996
(2447508.5)				4.743798	1.9219	5.9601	4.8492
A DEC.17 (0H)	Y:	+0.7211	-0.00562	+ 52.4282	+0.07929		+0.2472
				5.024224	5.7036		5.1590
DEC.17 (0H)	X:	+1.7832	+0.63469	+217.3247	+0.87361	+0.301388	+1.0508
(2447512.5)				5.551727	5.6339	2.6708	0.2149
A DEC.21 (0H)	Y:	+0.7521	-0.01567	+ 52.6881	+0.06382		+0.2517
				5.820689	0.5706		0.5216
DEC.21 (0H)	X:	+3.9431	-0.36966	+215.7352	+1.53677	+0.230117	+1.0769
(2447516.5)				0.059966	2.0727	5.2328	1.8690
A DEC.25 (0H)	Y:	+0.6896	+0.01666	+ 52.8830	+0.01921		+0.2555
				0.335303	2.3550		2.1631
DEC.25 (0H)	X:	+3.7621	-0.43089	+213.7144	+1.36880	+0.217516	+1.0667
(2447520.5)				0.861318	3.0323	0.0530	3.5234
A DEC.29 (0H)	Y:	+0.7258	+0.00508	+ 52.8878	+0.03461		+0.2558
				1.130987	3.4816		3.8002
DEC.29 (0H)	X:	+0.5474	+1.22009	+214.4586	+2.96594	+0.572351	+1.1074
(2447524.5)				1.661465	5.2538	2.7767	5.2092
A DEC.33 (0H)	Y:	+0.7706	-0.01649	+ 52.7728	+0.02932		+0.2596
				1.927675	5.0840		5.4395

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 3 DE JUPITER: GANYMEDE N=0.8782

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
JAN. 1 (OH)	X:	+0.2383	-0.00551	+288.2831	+1.01113	+0.001895	+0.2241
(2447161.5)				5.410017	2.6283	0.7352	1.0595
A JAN. 9 (OH)	Y:	+0.1107	-0.00430	+127.3789	+0.50328		+0.1009
				5.530004	2.7090		1.1789
JAN. 9 (OH)	X:	+0.2959	+0.01745	+280.8171	+0.97626	+0.006347	+0.2402
(2447169.5)				6.142235	3.4380	4.5894	2.3482
A JAN.17 (OH)	Y:	+0.1148	+0.00584	+123.6100	+0.51976		+0.1058
				6.261702	3.5251		2.4968
JAN.17 (OH)	X:	+0.6593	-0.06809	+273.6024	+0.93810	+0.021328	+0.2516
(2447177.5)				0.587301	4.1432	5.8607	3.7604
A JAN.25 (OH)	Y:	+0.1226	+0.00864	+119.8504	+0.53315		+0.1101
				0.707306	4.3248		3.9223
JAN.25 (OH)	X:	+0.5233	-0.04035	+267.1092	+0.91755	+0.014966	+0.2527
(2447185.5)				1.313519	5.0535	0.0843	5.2564
A FEV. 2 (OH)	Y:	+0.1355	+0.00664	+116.1335	+0.53155		+0.1114
				1.432916	5.0930		5.4065
FEV. 1 (OH)	X:	+0.3858	-0.00860	+261.9100	+0.95840	+0.004141	+0.2404
(2447192.5)				1.161256	5.0880	5.4103	5.0380
A FEV. 9 (OH)	Y:	+0.1386	-0.00018	+112.9547	+0.52796		+0.1045
				1.280762	4.9912		5.1454
FEV. 9 (OH)	X:	+0.3263	+0.00210	+256.4679	+0.97636	+0.002092	+0.2294
(2447200.5)				1.881957	5.8913	0.2664	0.1750
A FEV.17 (OH)	Y:	+0.1200	+0.00354	+109.4474	+0.52586		+0.0969
				2.002384	5.7490		0.2921
FEV.17 (OH)	X:	+0.5135	-0.04959	+251.4295	+0.90120	+0.013112	+0.2078
(2447208.5)				2.600702	0.4799	0.4396	1.5452
A FEV.25 (OH)	Y:	+0.1405	-0.00017	+106.0474	+0.51867		+0.0883
				2.722210	0.2289		1.6238
FEV.25 (OH)	X:	-0.0438	+0.13031	+247.2715	+0.98918	+0.034972	+0.1996
(2447216.5)				3.314980	0.9510	3.1489	2.7926
A MAR. 4 (OH)	Y:	+0.1710	-0.00227	+102.7934	+0.51537		+0.0913
				3.440644	0.9914		2.9666
MAR. 1 (OH)	X:	+0.2145	+0.05424	+245.1298	+1.06754	+0.014168	+0.2477
(2447221.5)				1.406923	5.5527	1.9913	5.2318
A MAR. 9 (OH)	Y:	+0.1937	-0.00170	+100.7990	+0.50039		+0.0979
				1.532313	5.3696		5.3903
MAR. 9 (OH)	X:	+0.7259	-0.05632	+241.3511	+0.97548	+0.010960	+0.2663
(2447229.5)				2.122064	0.2903	5.3483	0.4964
A MAR.17 (OH)	Y:	+0.1957	-0.00360	+ 97.7393	+0.49022		+0.1032
				2.248553	6.1119		0.6016
MAR.17 (OH)	X:	+0.1626	+0.06100	+238.7667	+0.88462	+0.019613	+0.2536
(2447237.5)				2.832113	0.7786	2.3978	1.9564
A MAR.25 (OH)	Y:	+0.1949	-0.00570	+ 94.8202	+0.48026		+0.1037
				2.963913	0.5566		2.0890
MAR.25 (OH)	X:	+0.4594	-0.00880	+236.7066	+1.02371	+0.010459	+0.2452
(2447245.5)				3.545013	1.6778	4.2848	3.4025
A AVR. 2 (OH)	Y:	+0.1392	+0.00139	+ 91.9815	+0.46280		+0.0986
				3.678399	1.2804		3.5749

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 3 DE JUPITER: GANYMEDE N=0.8782

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
AVR. 1 (OH)	X:	+0.0386	+0.09867	+235.1219	+0.88033	+0.027300	+0.2274
(2447252.5)				3.379980	1.4194	3.1635	3.0860
A AVR. 9 (OH)	Y:	+0.1493	-0.00162	+ 89.6194	+0.45721		+0.0928
				3.518255	1.1312		3.2464
AVR. 9 (OH)	X:	+0.5823	-0.04500	+234.1050	+1.06028	+0.010900	+0.2449
(2447260.5)				4.091982	2.4110	5.9068	4.4204
A AVR.17 (OH)	Y:	+0.1205	+0.00780	+ 86.9581	+0.43278		+0.0910
				4.232226	1.8512		4.5998
AVR.17 (OH)	X:	+0.3694	+0.02224	+233.2563	+0.98003	+0.003310	+0.2706
(2447268.5)				4.801478	3.2408	1.4210	5.8145
A AVR.25 (OH)	Y:	+0.1397	+0.01021	+ 84.4299	+0.41851		+0.0981
				4.946415	2.5722		5.9959
AVR.25 (OH)	X:	-0.0099	+0.12279	+232.9070	+1.01505	+0.029638	+0.2937
(2447276.5)				5.512319	4.2326	2.8482	0.9395
A MAI 3 (OH)	Y:	+0.1947	-0.00384	+ 82.0046	+0.40484		+0.1032
				5.660427	3.2598		1.1520
MAI 1 (OH)	X:	+0.5700	-0.02709	+233.6135	+0.98777	+0.007527	+0.3063
(2447282.5)				4.471727	2.9184	5.1872	5.3090
A MAI 9 (OH)	Y:	+0.1432	+0.00527	+ 80.2046	+0.38907		+0.1058
				4.625867	2.2358		5.4673
MAI 9 (OH)	X:	+0.3100	+0.01629	+234.2018	+0.98728	+0.004347	+0.3103
(2447290.5)				5.181893	3.8024	2.6102	0.4960
A MAI 17 (OH)	Y:	+0.1377	+0.00212	+ 77.9149	+0.37664		+0.1035
				5.341304	2.9468		0.6790
MAI 17 (OH)	X:	+0.5665	-0.04893	+235.5599	+0.86082	+0.014016	+0.3140
(2447298.5)				5.890066	4.4653	5.4035	1.9636
A MAI 25 (OH)	Y:	+0.1276	+0.00034	+ 75.6886	+0.35597		+0.0974
				6.056959	3.6386		2.1408
MAI 25 (OH)	X:	+0.2207	+0.02896	+237.4259	+1.05112	+0.007580	+0.2978
(2447306.5)				0.318599	5.2868	2.2411	3.3941
A JUN. 2 (OH)	Y:	+0.1597	-0.00842	+ 73.5171	+0.33029		+0.0896
				0.490423	4.3331		3.5553
JUN. 1 (OH)	X:	+0.1733	+0.04529	+239.3978	+1.06838	+0.008048	+0.3084
(2447313.5)				0.155394	5.1918	2.5227	3.0519
A JUN. 9 (OH)	Y:	+0.1409	-0.00322	+ 71.7258	+0.31784		+0.0908
				0.333382	4.1564		3.2193
JUN. 9 (OH)	X:	+0.4352	+0.00019	+241.9641	+0.99564	+0.005277	+0.3362
(2447321.5)				0.866132	6.0098	4.8021	4.4606
A JUN.17 (OH)	Y:	+0.1566	-0.00530	+ 69.7356	+0.29852		+0.0963
				1.052616	4.8597		4.6559
JUN.17 (OH)	X:	+0.1750	+0.03194	+245.4541	+0.99816	+0.017017	+0.3781
(2447329.5)				1.578192	0.3167	2.1570	5.9302
A JUN.25 (OH)	Y:	+0.1710	-0.01426	+ 67.8197	+0.27565		+0.1011
				1.773773	5.5899		6.1697
JUN.25 (OH)	X:	+0.2551	+0.01149	+248.9873	+1.03703	+0.008355	+0.3942
(2447337.5)				2.291933	1.1914	3.5170	1.1799
A JUL. 3 (OH)	Y:	+0.1105	-0.00487	+ 66.0485	+0.25489		+0.1005
				2.495666	6.2525		1.4263

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 3 DE JUPITER: GANYMEDE N=0.8782

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
JUL. 1 (OH)	X:	+0.4908	-0.07591	+251.7934	+0.95287	+0.013977	+0.3732
(2447343.5)				1.256722	0.3560	0.0131	5.4522
A JUL. 9 (OH)	Y:	+0.1204	-0.01054	+ 64.7624	+0.23418		+0.0952
				1.468015	5.2238		5.6959
JUL. 9 (OH)	X:	+0.4460	-0.06462	+256.3839	+1.09634	+0.013145	+0.3795
(2447351.5)				1.973500	1.1475	5.8245	0.6674
A JUL.17 (OH)	Y:	+0.0830	-0.00449	+ 63.2014	+0.21335		+0.0911
				2.193690	5.9179		0.8946
JUL.17 (OH)	X:	-0.1476	+0.07605	+261.7639	+0.85885	+0.022026	+0.3654
(2447359.5)				2.688838	1.7714	2.6126	2.0586
A JUL.25 (OH)	Y:	+0.0906	-0.00798	+ 61.7732	+0.18653		+0.0876
				2.921605	0.3629		2.3188
JUL.25 (OH)	X:	+0.8044	-0.13064	+267.6402	+1.33346	+0.037724	+0.4058
(2447367.5)				3.411681	2.4437	5.3394	3.4101
A AOU. 2 (OH)	Y:	+0.0435	+0.00427	+ 60.4849	+0.14860		+0.0942
				3.651258	1.0772		3.7294
AOU. 1 (OH)	X:	+0.4704	-0.05331	+272.7369	+1.15550	+0.020751	+0.4344
(2447374.5)				3.255982	2.4189	4.8911	3.1553
A AOU. 9 (OH)	Y:	+0.0708	-0.00274	+ 59.5673	+0.12238		+0.0970
				3.506307	0.9296		3.4640
AOU. 9 (OH)	X:	+0.0560	-0.00749	+278.8812	+1.12789	+0.009866	+0.4854
(2447382.5)				3.978365	3.4151	0.9453	4.7082
A AOU.17 (OH)	Y:	+0.0429	-0.00034	+ 58.7187	+0.08610		+0.1003
				4.240266	1.7100		4.9867
AOU.17 (OH)	X:	+0.0080	+0.01768	+285.9773	+0.94600	+0.015799	+0.4952
(2447390.5)				4.703670	4.2265	4.2277	6.2727
A AOU.25 (OH)	Y:	-0.0083	+0.00854	+ 58.1304	+0.05060		+0.0951
				4.977175	2.8424		0.2339
AOU.25 (OH)	X:	-0.2801	+0.04576	+293.2228	+1.17134	+0.012865	+0.4642
(2447398.5)				5.433500	4.9868	1.7620	1.4710
A SEP. 2 (OH)	Y:	-0.0296	+0.01260	+ 57.8784	+0.03395		+0.0915
				5.715220	4.5596		1.7527
SEP. 1 (OH)	X:	-0.5659	+0.11313	+299.7060	+1.32636	+0.028013	+0.4461
(2447405.5)				5.288871	4.9363	1.9630	1.1497
A SEP. 9 (OH)	Y:	-0.0351	+0.01386	+ 57.9215	+0.06127		+0.0881
				5.577119	5.2148		1.4476
SEP. 9 (OH)	X:	+0.1162	-0.01457	+307.8035	+1.02189	+0.010939	+0.4816
(2447413.5)				6.020955	5.9427	4.6353	2.5772
A SEP.17 (OH)	Y:	-0.0315	+0.01587	+ 58.3759	+0.10316		+0.0894
				0.035165	6.1833		2.9095
SEP.17 (OH)	X:	-0.0980	+0.00506	+316.2097	+0.89235	+0.023203	+0.5442
(2447421.5)				0.476332	0.2716	1.5359	4.0752
A SEP.25 (OH)	Y:	+0.0335	+0.00452	+ 59.1969	+0.15982		+0.0947
				0.777273	0.7810		4.4081
SEP.25 (OH)	X:	-0.5925	+0.13892	+324.4641	+0.92798	+0.047447	+0.5837
(2447429.5)				1.218486	0.9017	2.9651	5.6248
A OCT. 3 (OH)	Y:	+0.0922	-0.01344	+ 60.4457	+0.22703		+0.1063
				1.521413	1.5467		5.9513

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 3 DE JUPITER: GANYMEDE N=0.8782

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
OCT. 1 (0H)	X:	+0.0493	-0.07287	+329.9341	+0.76859	+0.028268	+0.6072
(2447435.5)				0.204716	0.4003	0.9537	3.6266
A OCT. 9 (0H)	Y:	-0.0018	+0.00737	+ 61.7594	+0.25712		+0.1053
				0.508680	0.5593		3.9351
OCT. 9 (0H)	X:	-0.6682	+0.13575	+337.4055	+0.97113	+0.052051	+0.5857
(2447443.5)				0.954290	0.9350	3.2163	5.2333
A OCT.17 (0H)	Y:	+0.0428	-0.00919	+ 63.7948	+0.31785		+0.1089
				1.254087	1.3373		5.5111
OCT.17 (0H)	X:	+0.4354	-0.17161	+343.0884	+1.26385	+0.038774	+0.5423
(2447451.5)				1.704538	2.2764	5.7209	0.4535
A OCT.25 (0H)	Y:	+0.0212	-0.00765	+ 66.2984	+0.35489		+0.1097
				2.000570	2.1021		0.7188
OCT.25 (0H)	X:	-0.3629	+0.05896	+349.5758	+0.77262	+0.018933	+0.5408
(2447459.5)				2.458283	3.2599	4.2101	1.8705
A NOV. 2 (0H)	Y:	+0.0026	-0.00420	+ 69.1046	+0.38099		+0.1088
				2.747725	2.8849		2.1837
NOV. 1 (0H)	X:	-0.7448	+0.17019	+353.8031	+0.64533	+0.035058	+0.5482
(2447466.5)				2.334635	3.6555	3.4122	1.5583
A NOV. 9 (0H)	Y:	+0.0021	-0.00145	+ 71.7270	+0.39023		+0.1130
				2.617408	2.7761		1.8837
NOV. 9 (0H)	X:	-0.1642	+0.01252	+356.2838	+0.91581	+0.016202	+0.5814
(2447474.5)				3.094340	4.3222	0.2222	3.1154
A NOV.17 (0H)	Y:	-0.0304	+0.01059	+ 74.7632	+0.38336		+0.1222
				3.366233	3.6017		3.3703
NOV.17 (0H)	X:	+0.1163	-0.06490	+357.9685	+0.73200	+0.022448	+0.5919
(2447482.5)				3.855507	5.3791	0.1845	4.6675
A NOV.25 (0H)	Y:	-0.0105	+0.00569	+ 77.7225	+0.34670		+0.1301
				4.116734	4.4013		4.9475
NOV.25 (0H)	X:	-1.0162	+0.20372	+356.4744	+1.17387	+0.057490	+0.6081
(2447490.5)				4.616444	6.0883	2.6054	6.2071
A DEC. 3 (0H)	Y:	+0.0652	-0.01718	+ 80.4113	+0.27806		+0.1368
				4.867525	5.2420		0.2092
DEC. 1 (0H)	X:	-0.1247	-0.01746	+356.0526	+0.87717	+0.006513	+0.5385
(2447496.5)				3.616331	5.6908	0.1556	4.2774
A DEC. 9 (0H)	Y:	-0.0449	+0.00841	+ 82.0373	+0.23794		+0.1244
				3.860283	4.3059		4.5308
DEC. 9 (0H)	X:	+0.0005	-0.05637	+352.6009	+0.82083	+0.017562	+0.4905
(2447504.5)				4.376782	0.4334	0.6964	5.7595
A DEC.17 (0H)	Y:	+0.0207	-0.00625	+ 83.7718	+0.15140		+0.1224
				4.611116	5.2455		6.0433
DEC.17 (0H)	X:	-0.0097	-0.01550	+347.5045	+1.06367	+0.013157	+0.4830
(2447512.5)				5.133904	1.2767	3.8360	0.9620
A DEC.25 (0H)	Y:	+0.0828	-0.02286	+ 84.7798	+0.09125		+0.1188
				5.360349	0.3586		1.1918
DEC.25 (0H)	X:	+0.1893	-0.07062	+341.4120	+1.10413	+0.010106	+0.4757
(2447520.5)				5.889353	2.3032	6.1216	2.4234
A DEC.33 (0H)	Y:	+0.0857	-0.02327	+ 85.0220	+0.08795		+0.1200
				6.108777	2.0879		2.6261

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 4 DE JUPITER: CALLISTO N=0.3765

		A0	A1	B0 F0	B1 F1	C0 P0
JAN. 1 (0H) (2447161.5)	X:	+ 3.1991	- 0.23379	+506.3564 3.146020	+ 1.61110 0.1809	+1.1856 0.7821
A JAN. 9 (0H)	Y:	+ 0.6014	+ 0.01912	+222.8051 3.269380	+ 0.88987 0.2904	+0.5441 0.8998
JAN. 9 (0H) (2447169.5)	X:	-12.1182	+ 3.89007	+480.2122 6.177102	+ 1.22490 5.9995	+2.2165 0.4741
A JAN.17 (0H)	Y:	- 5.4139	+ 1.68244	+210.9542 0.021100	+ 0.44708 5.7622	+0.9426 0.5601
JAN.17 (0H) (2447177.5)	X:	+ 9.1904	- 1.17661	+477.8901 2.875440	+ 1.16802 0.7814	+1.1574 0.6007
A JAN.25 (0H)	Y:	+ 4.1727	- 0.63370	+207.7421 3.002472	+ 0.57524 0.7647	+0.5044 0.7733
JAN.25 (0H) (2447185.5)	X:	+ 8.9388	- 1.39651	+477.3248 5.853550	+ 2.84978 3.3168	+0.9382 0.1689
A FEV. 2 (0H)	Y:	+ 3.4601	- 0.57798	+205.8792 5.976688	+ 1.38409 3.3093	+0.4027 0.3166
FEV. 1 (0H) (2447192.5)	X:	+ 7.2067	- 0.93542	+456.2177 2.195472	+ 1.00364 6.0160	+1.1077 5.0927
A FEV. 9 (0H)	Y:	+ 2.8210	- 0.41779	+195.4671 2.320868	+ 0.61334 5.8647	+0.4745 5.2358
FEV. 9 (0H) (2447200.5)	X:	+ 6.7004	- 1.04959	+456.2623 5.190788	+ 2.42380 3.1019	+1.4043 4.9186
A FEV.17 (0H)	Y:	+ 1.8250	- 0.25402	+192.5976 5.314396	+ 1.04402 2.9314	+0.5855 5.1056
FEV.17 (0H) (2447208.5)	X:	-10.5935	+ 3.50729	+459.6038 1.905235	+ 4.23588 6.2205	+1.3606 5.3109
A FEV.25 (0H)	Y:	- 4.3561	+ 1.40572	+192.4470 2.027200	+ 1.86244 6.1112	+0.6018 5.4112
FEV.25 (0H) (2447216.5)	X:	+ 8.6287	- 1.01621	+441.1207 4.880493	+ 2.50909 2.7848	+1.1686 4.2863
A MAR. 4 (0H)	Y:	+ 3.4466	- 0.46050	+182.3877 5.007723	+ 1.23028 2.6183	+0.4676 4.4065
MAR. 1 (0H) (2447221.5)	X:	+11.6520	- 2.42059	+435.5884 0.434176	+ 2.82408 4.0344	+1.3377 2.4021
A MAR. 9 (0H)	Y:	+ 4.2807	- 0.91024	+177.4434 0.565012	+ 1.37902 3.9888	+0.5589 2.5149
MAR. 9 (0H) (2447229.5)	X:	- 7.1899	+ 2.59302	+430.0716 3.413919	+ 2.68366 0.7004	+1.3508 1.2117
A MAR.17 (0H)	Y:	- 3.2657	+ 1.07409	+172.2116 3.543718	+ 1.39609 0.6108	+0.5225 1.3269
MAR.17 (0H) (2447237.5)	X:	+ 2.8713	+ 0.16762	+419.8117 0.143601	+ 1.64886 4.6231	+1.3166 1.3459
A MAR.25 (0H)	Y:	+ 1.4943	- 0.05350	+165.7182 0.274792	+ 0.83723 4.0915	+0.5090 1.5595
MAR.25 (0H) (2447245.5)	X:	+ 6.2883	- 0.49174	+415.2921 3.129769	+ 1.80323 1.5725	+1.2500 1.2197
A AVR. 2 (0H)	Y:	+ 2.5249	- 0.28809	+160.1010 3.270129	+ 0.72172 1.1502	+0.4816 1.3998

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 4 DE JUPITER: CALLISTO N=0.3765

		A0	A1	B0 F0	B1 F1	C0 P0
AVR. 1 (OH)	X:	+ 8.2492	- 0.94239	+418.7689	+ 2.17612	+0.9848
(2447252.5)				5.724497	3.6560	0.1853
A AVR. 9 (OH)	Y:	+ 3.0413	- 0.39517	+158.4109	+ 1.08580	+0.3589
				5.863532	3.3206	0.3912
AVR. 9 (OH)	X:	+14.1516	- 2.85619	+397.7502	+ 1.14497	+0.8800
(2447260.5)				2.430203	2.4402	5.4401
A AVR.17 (OH)	Y:	+ 4.8470	- 1.00593	+147.0801	+ 0.02273	+0.3033
				2.579625	5.6860	5.7099
AVR.17 (OH)	X:	- 6.1873	+ 2.32064	+398.7689	+ 1.17236	+1.7984
(2447268.5)				5.409302	5.0248	5.8727
A AVR.25 (OH)	Y:	- 2.9488	+ 0.96628	+142.5639	+ 0.03762	+0.6654
				5.563368	3.9992	6.0258
AVR.25 (OH)	X:	+ 0.9416	+ 0.79951	+414.5090	+ 2.29489	+1.4095
(2447276.5)				2.105009	0.4710	5.5792
A MAI 3 (OH)	Y:	+ 0.7724	+ 0.14784	+143.8563	+ 0.82448	+0.4811
				2.258225	6.2405	5.7300
MAI 1 (OH)	X:	+ 1.2237	+ 0.48367	+408.8523	+ 1.32556	+1.3141
(2447282.5)				4.332097	2.9155	3.8164
A MAI 9 (OH)	Y:	- 0.6654	+ 0.35536	+138.4234	+ 0.52017	+0.4199
				4.485167	1.7212	4.0718
MAI 9 (OH)	X:	- 2.5890	+ 1.64075	+415.2591	+ 2.91886	+0.8967
(2447290.5)				1.051595	6.0841	3.3982
A MAI 17 (OH)	Y:	- 0.5001	+ 0.44698	+136.8776	+ 0.81094	+0.3150
				1.210927	5.5121	3.6320
MAI 17 (OH)	X:	+ 5.1730	+ 0.05109	+416.3573	+ 1.93087	+1.4120
(2447298.5)				4.011796	2.4934	2.9223
A MAI 25 (OH)	Y:	+ 1.7570	- 0.09762	+132.5292	+ 0.71577	+0.4539
				4.184362	1.8578	3.1341
MAI 25 (OH)	X:	+14.1457	- 2.64305	+418.4067	+ 1.35293	+1.8738
(2447306.5)				0.676186	4.3644	2.9634
A JUN. 2 (OH)	Y:	+ 4.1978	- 0.80652	+127.6582	+ 0.89237	+0.5858
				0.852610	4.0177	3.1312
JUN. 1 (OH)	X:	+16.0152	- 2.90586	+414.3142	+ 3.32064	+1.5853
(2447313.5)				3.347108	2.6995	2.1626
A JUN. 9 (OH)	Y:	+ 4.9540	- 0.97434	+123.4283	+ 0.61575	+0.5095
				3.535348	2.3642	2.3676
JUN. 9 (OH)	X:	+ 2.3743	+ 0.23332	+426.1517	+ 2.11136	+1.2897
(2447321.5)				0.017998	5.1361	1.4086
A JUN.17 (OH)	Y:	- 0.2351	+ 0.25859	+121.1631	+ 0.49717	+0.3609
				0.214731	4.4037	1.5697
JUN.17 (OH)	X:	- 3.2583	+ 1.87081	+438.7749	+ 1.92001	+1.7311
(2447329.5)				2.979201	1.0919	0.9039
A JUN.25 (OH)	Y:	- 0.3669	+ 0.36692	+119.2942	+ 0.74174	+0.4463
				3.179852	0.4782	1.1693
JUN.25 (OH)	X:	+ 2.6670	+ 0.69103	+435.1003	+ 1.72502	+1.7103
(2447337.5)				5.979277	5.2159	0.9372
A JUL. 3 (OH)	Y:	+ 0.8705	+ 0.08845	+114.5493	+ 0.38284	+0.4263
				6.184757	3.5982	1.2135

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 4 DE JUPITER: CALLISTO N=0.3765

		A0	A1	B0 F0	B1 F1	C0 P0
JUL. 1 (0H) (2447343.5)	X:	- 2.8314	+ 1.75373	+452.5783 1.936547	+ 2.74259 0.5268	+1.8530 5.5228
A JUL. 9 (0H)	Y:	- 0.8149	+ 0.46446	+115.0935 2.147385	+ 0.75601 6.0833	+0.4844 5.7546
JUL. 9 (0H) (2447351.5)	X:	+ 1.4340	+ 1.18368	+447.7153 4.908106	+ 1.01821 4.3187	+1.4355 5.3510
A JUL.17 (0H)	Y:	+ 0.3248	+ 0.24142	+108.9267 5.134207	+ 0.33413 2.0236	+0.3536 5.6208
JUL.17 (0H) (2447359.5)	X:	+17.4913	- 2.98288	+447.7178 1.600474	+ 1.59902 2.2013	+1.7632 4.3483
A JUL.25 (0H)	Y:	+ 4.2340	- 0.77421	+103.6185 1.839806	+ 0.40115 3.7468	+0.3818 4.5509
JUL.25 (0H) (2447367.5)	X:	+ 8.4833	- 1.06960	+473.2194 4.618485	+ 2.70481 3.7216	+1.9300 4.4425
A AOU. 2 (0H)	Y:	+ 0.8749	- 0.04160	+105.0044 4.856161	+ 0.24845 2.5568	+0.4090 4.8239
AOU. 1 (0H) (2447374.5)	X:	+10.8776	- 1.45665	+478.0588 0.926671	+ 0.79686 0.4230	+2.1326 3.4931
A AOU. 9 (0H)	Y:	+ 1.2515	- 0.09151	+103.3192 1.191488	+ 0.24986 4.6337	+0.4170 3.7924
AOU. 9 (0H) (2447382.5)	X:	- 0.0878	+ 1.08604	+488.9463 3.922803	+ 1.20347 3.6563	+1.5467 3.4057
A AOU.17 (0H)	Y:	- 0.1143	+ 0.22529	+101.2048 4.188084	+ 0.18736 0.6497	+0.3208 3.7592
AOU.17 (0H) (2447390.5)	X:	- 2.4632	+ 2.34559	+501.0885 0.668622	+ 3.67146 0.2002	+1.4500 2.7328
A AOU.25 (0H)	Y:	- 0.4687	+ 0.41474	+100.9956 0.940885	+ 0.32914 0.0029	+0.2904 3.0915
AOU.25 (0H) (2447398.5)	X:	+19.0992	- 3.21844	+514.0363 3.676350	+ 4.27786 3.1795	+2.5807 2.8304
A SEP. 2 (0H)	Y:	+ 4.3501	- 0.80930	+100.9741 3.969060	+ 0.65437 3.1208	+0.5361 3.1052
SEP. 1 (0H) (2447405.5)	X:	+15.0895	- 2.23194	+535.0733 6.251884	+ 0.62884 4.8746	+2.1168 1.9731
A SEP. 9 (0H)	Y:	+ 3.1791	- 0.59130	+101.6960 0.250691	+ 0.34043 3.3113	+0.4481 2.3002
SEP. 9 (0H) (2447413.5)	X:	+14.7351	- 2.18734	+533.4389 3.003592	+ 3.38927 2.9933	+1.9638 1.6538
A SEP.17 (0H)	Y:	+ 2.0331	- 0.22211	+100.5849 3.298444	+ 0.35453 3.1276	+0.3694 1.8892
SEP.17 (0H) (2447421.5)	X:	- 0.8691	+ 1.34878	+550.6928 6.006961	+ 2.92189 5.9421	+2.0482 1.0183
A SEP.25 (0H)	Y:	- 0.4815	+ 0.25389	+101.9906 0.030123	+ 0.49165 6.1086	+0.3827 1.3187
SEP.25 (0H) (2447429.5)	X:	- 5.6142	+ 3.29351	+585.1855 2.713688	+ 1.30856 0.9369	+2.9818 0.7855
A OCT. 3 (0H)	Y:	- 0.6894	+ 0.55418	+107.0718 3.015767	+ 0.18141 1.4282	+0.5056 1.0634

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 4 DE JUPITER: CALLISTO N=0.3765

		A0	A1	B0 F0	B1 F1	C0 P0
OCT. 1 (OH)	X:	- 3.0000	+ 1.85622	+569.8428	+ 2.93428	+2.6304
(2447435.5)				4.980302	5.5756	5.5738
A OCT. 9 (OH)	Y:	- 0.4530	+ 0.28218	+105.3578	+ 0.64746	+0.5006
				5.291522	5.5393	5.8594
OCT. 9 (OH)	X:	- 1.6720	+ 2.44066	+602.5373	+ 2.05020	+2.4595
(2447443.5)				1.729862	1.1248	5.4955
A OCT.17 (OH)	Y:	- 0.9971	+ 0.59925	+113.3223	+ 0.59813	+0.4834
				2.029835	1.2951	5.7512
OCT.17 (OH)	X:	+12.2097	- 1.28820	+610.8208	+ 1.13372	+2.0106
(2447451.5)				4.743581	4.7152	4.8390
A OCT.25 (OH)	Y:	+ 3.5413	- 0.58299	+117.7976	+ 0.58480	+0.3554
				5.044143	4.3826	5.0187
OCT.25 (OH)	X:	+21.5823	- 3.58045	+601.6075	+ 3.94954	+2.6040
(2447459.5)				1.456518	2.8917	4.4214
A NOV. 2 (OH)	Y:	+ 2.9178	- 0.45229	+117.7608	+ 0.81588	+0.4849
				1.759019	2.3508	4.7184
NOV. 1 (OH)	X:	+18.2648	- 3.12367	+625.5655	+ 2.30539	+3.1078
(2447466.5)				4.150655	3.9388	3.6335
A NOV. 9 (OH)	Y:	+ 2.8503	- 0.44993	+125.4288	+ 0.85014	+0.5682
				4.426159	4.1697	3.9027
NOV. 9 (OH)	X:	+ 4.6378	+ 0.35280	+628.9418	+ 1.11182	+2.3157
(2447474.5)				0.874421	2.2149	3.7012
A NOV.17 (OH)	Y:	+ 0.4003	+ 0.17314	+130.2886	+ 0.65908	+0.4809
				1.151106	1.1578	3.9344
NOV.17 (OH)	X:	- 6.6440	+ 3.30835	+628.5318	+ 3.63893	+1.7042
(2447482.5)				3.874391	6.0510	3.2555
A NOV.25 (OH)	Y:	- 1.7187	+ 0.76387	+133.6924	+ 0.63920	+0.3501
				4.138031	5.3702	3.5498
NOV.25 (OH)	X:	+19.2619	- 2.68006	+627.4938	+ 3.50637	+2.7876
(2447490.5)				0.625584	2.8017	3.0598
A DEC. 3 (OH)	Y:	+ 5.2013	- 0.84699	+137.9503	+ 0.73239	+0.6748
				0.871064	2.2848	3.2387
DEC. 1 (OH)	X:	- 7.4720	+ 3.45857	+640.3480	+ 3.34298	+2.8202
(2447496.5)				2.904202	5.8680	1.0704
A DEC. 9 (OH)	Y:	- 2.2980	+ 0.87854	+145.1317	+ 0.31734	+0.6430
				3.143367	5.8471	1.2244
DEC. 9 (OH)	X:	+ 9.2510	- 0.16152	+620.4049	+ 2.16951	+2.2767
(2447504.5)				5.946506	1.9596	1.1189
A DEC.17 (OH)	Y:	+ 2.9388	- 0.24596	+145.9419	+ 0.25064	+0.5047
				6.178042	1.3925	1.4073
DEC.17 (OH)	X:	+15.3360	- 2.29127	+600.9809	+ 1.81456	+1.8910
(2447512.5)				2.703731	4.2164	1.0704
A DEC.25 (OH)	Y:	+ 2.8374	- 0.45192	+145.2231	+ 0.46040	+0.4984
				2.932413	3.5579	1.2303
DEC.25 (OH)	X:	+ 7.7845	- 0.57011	+603.3920	+ 1.79471	+1.9053
(2447520.5)				5.721312	2.4148	0.4408
A DEC.33 (OH)	Y:	+ 1.3160	+ 0.01088	+147.6257	+ 0.09276	+0.4711
				5.943572	2.0428	0.6231

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 polynômial.

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 $T1$ du phénomène proche de la date T est donnée par la relation :

$$T1 = K \times P + \tau/24 + T0 \qquad (2)$$

où K représente la partie entière de la quantité $(T - T0)/P$ et où τ est donné, sur l'intervalle $T0$, $T0 + DT$ par un polynôme de la forme :

$$\tau = C0 + C1\,x + C2\,x^2 + \ldots\ldots + Cn\,x^n \qquad (3)$$

avec $$x = \{2(T - T0)/DT\} - 1 \qquad (4)$$

$T1$ ayant été obtenu par la relation (2), on peut réitérer le calcul en substituant $T1$ à T dans la formule (4) pour obtenir une date $T2$ plus proche du phénomène recherché que $T1$. La précision de ce type de prédiction est meilleure que 60 secondes de temps.

Les tables donnent les coefficients Ci de la formule (3), numérotés de $C0$ à $C9$ 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 1988.

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 $T1$ of a phenomenon close to a date T is given by :

$$T1 = K \times P + \tau/24 + T0 \qquad (2)$$

where K is the integer part of $(T - T0)/P$ and where τ is given (on the interval $T0$, $T0 + DT$) by a polynomial :

$$\tau = C0 + C1\,x + C2\,x^2 + \ldots\ldots + Cn\,x^n \qquad (3)$$

with $$x = \{2(T - T0)/DT\} - 1 \qquad (4)$$

The value $T1$ deduced from equation (2) is then substituted in place of T in equation (4). The new iteration yields a date $T2$ closer to the date of the phenomenon than $T1$. The precision of this type of prediction is better than 60 seconds of time. The tables give the coefficients Ci in formula (3), numbered from $C0$ to $C9$, 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 30 th of June 1988.

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 1988, 182 jours se sont écoulés, on a donc :

$T = 182$ et la formule (4) donne alors :

$$x = 2(182 - 0)/366 - 1 = -0{,}005\,464\,481$$

La formule (3) donne ensuite :

$$\tau = 16.202\,408 + 2.471\,295\,x - 2.563\,902\,x^2 - 2.799\,671\,x^3 - 1.417\,291\,x^4 - 0.520\,081\,x^5 + 2.484\,159\,x^6 + 2.044\,090\,x^7 - 0.669\,092\,x^8 - 0.836\,007\,x^9$$

d'où : $= 16.188\,827\,56$

On a d'autre part :

$$K = \text{partie entière de } (182 - 0)/1{,}769\,860\,5 = 102$$

La formule (2) donne alors :

$T1 = 102 \times 1{,}769\,860\,5 + 16{,}188\,827\,56/24 + 0$

$T1 = 181{,}200\,305\,5$ jours depuis le 0 janvier (début de l'intervalle pour les occultations) soit OC.D le 29 Juin 1988 à 4 h 48 min 26 s TDT. Le calcul réitéré donne $T2 = 181{,}199\,848\,5$ jours soit le 29 Juin 1988 à 4 h 47 min 47 s TDT.

On trouverait de même pour les autres phénomènes :

OC.F : le 29 juin à 6 h 58 min 20 s TDT
EC.D : le 29 juin à 3 h 52 min 07 s TDT
EC.F : le 29 juin à 6 h 02 min 21 s TDT
PA.D : le 30 juin à 2 h 07 min 27 s TDT
PA.F : le 30 juin à 4 h 16 min 29 s TDT
OM.D : le 30 juin à 1 h 12 min 21 s TDT
OM.F : le 30 juin à 3 h 21 min 09 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 29 Juin à 3 h 52 min 07 s observable
OC.D : le 29 Juin à 4 h 47 min 47 s inobservable car déjà éclipsé
EC.F : le 29 Juin à 6 h 02 min 21 s inobservable car encore occulté
OC.F : le 29 Juin à 6 h 58 min 20 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 1988, 182 days have elapsed

$T = 182$ *and formula (4) gives :*

$$x = 2(182 - 0)/366 - 1 = -0.005\,464\,481$$

Formula (3) then gives :

$$\tau = 16.202\,408 + 2.471\,295\,x - 2.563\,902\,x^2 - 2.799\,671\,x^3 - 1.417\,291\,x^4 - 0.520\,081\,x^5 + 2.484\,159\,x^6 + 2.044\,090\,x^7 - 0.669\,092\,x^8 - 0.836\,007\,x^9$$

therefore $= 16.188\,827\,56$

On the other hand,

$$K = \text{integer part of } (182 - 0)/1.769\,860\,5 = 102$$

Formula (2) then gives :

$T1 = 102 \times 1.769\,860\,5 + 16.188\,827\,56/24 + 0$

$T1 = 181.200\,305\,5$ *days from January 0 (beginning of the interval for the occultations) that is June the 29th 1988 at 4 h 48 min 26 s TDT. Another iteration gives* $T2 = 181.199\,848\,5$ *days that is June the 29th 1988 at 4 h 47 min 47 s TDT.*

One would find as well for the other phenomena :

OC.F : June the 29th at 6 h 58 min 20 s TDT
EC.D : June the 29th at 3 h 52 min 07 s TDT
EC.F : June the 29th at 6 h 02 min 21 s TDT
PA.D : June the 30th at 2 h 07 min 27 s TDT
PA.F : June the 30th at 4 h 16 min 29 s TDT
OM.D : June the 30th at 1 h 12 min 21 s TDT
OM.F : June the 30th at 3 h 21 min 09 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 29th at 3 h 52 min 07 s observable
OC.D : June the 29th at 4 h 47 min 47 s unobservable as already eclipsed
EC.F : June the 29th at 6 h 02 min 21 s unobservable as yet occulted
OC.F : June the 29th at 6 h 58 min 20 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 1988 SATELLITE 1 P = 1.7698605 JOURS TO = 0.0 DT = 366.JOURS

	EC.D		EC.F		OM.D		OM.F
0	15.250131	0	17.420698	0	36.586504	0	38.732910
1	-0.004156	1	0.010040	1	-0.137298	1	-0.208554
2	-0.222646	2	-0.230259	2	-0.494793	2	-0.480481
3	0.101440	3	0.083278	3	0.089018	3	0.325367
4	0.137230	4	0.148345	4	0.074644	4	0.185002
5	0.142835	5	0.151952	5	0.396148	5	0.209786
6	-0.012763	6	-0.016237	6	0.310482	6	0.104017
7	-0.120914	7	-0.125897	7	-0.283614	7	-0.312694
8	-0.008171	8	-0.007427	8	-0.169956	8	-0.071658
9	0.027043	9	0.028820	9	0.047933	9	0.100466

	OC.D		OC.F		PA.D		PA.F
0	16.202408	0	18.376933	0	37.516726	0	39.665831
1	2.471295	1	2.447803	1	2.222628	1	2.114676
2	-2.563902	2	-2.578242	2	-2.876745	2	-2.842995
3	-2.799671	3	-2.837696	3	-2.297712	3	-2.081206
4	-1.417291	4	-1.409489	4	-1.141525	4	-1.105247
5	-0.520081	5	-0.438070	5	-1.093703	5	-1.220865
6	2.484159	6	2.519219	6	2.324854	6	2.220224
7	2.044090	7	2.015899	7	2.455298	7	2.425141
8	-0.669092	8	-0.695321	8	-0.618755	8	-0.566895
9	-0.836007	9	-0.839183	9	-0.957913	9	-0.920087

TO = 0 CORRESPOND AU 0 JANVIER 1988 à 0 H SOIT LA DATE JULIENNE 2447160.5

AN 1988 SATELLITE 2 P = 3.5540942 JOURS TO = 0.0 DT = 366.JOURS

	EC.D		EC.F		OM.D		OM.F
0	13.504619	0	15.770664	0	55.809383	0	58.067105
1	-0.420444	1	-0.438182	1	0.551384	1	0.503481
2	-1.085876	2	-1.003337	2	0.226737	2	0.262576
3	0.835216	3	0.865507	3	-0.568247	3	-0.329629
4	0.687164	4	0.674508	4	-0.286515	4	-0.170241
5	-0.365874	5	-0.386474	5	0.707759	5	0.464158
6	-0.272211	6	-0.264587	6	0.264518	6	0.068266
7	0.300352	7	0.301915	7	-0.426246	7	-0.389102
8	0.083638	8	0.079796	8	-0.106845	8	-0.014920
9	-0.148498	9	-0.144563	9	0.095265	9	0.120429

	OC.D		OC.F		PA.D		PA.F
0	15.377212	0	17.658096	0	57.720140	0	59.995560
1	4.394890	1	4.235196	1	5.579591	1	5.381706
2	-5.821840	2	-5.667291	2	-4.534444	2	-4.461860
3	-4.051204	3	-4.185627	3	-6.460709	3	-6.342144
4	-2.295443	4	-2.537032	4	-3.026208	4	-3.129026
5	-2.920903	5	-2.606706	5	-0.726126	5	-0.686741
6	4.535192	6	4.864112	6	4.751640	6	4.932367
7	5.227219	7	5.183193	7	4.082940	7	4.101060
8	-1.147047	8	-1.306064	8	-1.203000	8	-1.301298
9	-1.971004	9	-2.019165	9	-1.683926	9	-1.718013

TO = 0 CORRESPOND AU 0 JANVIER 1988 à 0 H SOIT LA DATE JULIENNE 2447160.5

AN 1988 SATELLITE 3 P = 7.1663872 JOURS TO = 0.0 DT = 366.JOURS

	EC.D		EC.F		OM.D		OM.F
0	52.452297	0	54.566631	0	138.568223	0	140.661004
1	0.468984	1	0.427586	1	0.392207	1	0.299873
2	-0.391266	2	-0.206752	2	-0.497400	2	-0.351809
3	0.353045	3	0.343228	3	-0.095794	3	0.109460
4	0.172858	4	0.131495	4	-0.142446	4	0.011811
5	-0.758913	5	-0.731236	5	1.049383	5	0.900157
6	-0.045382	6	-0.010882	6	0.571814	6	0.302514
7	1.215511	7	1.195933	7	-1.323579	7	-1.386084
8	0.008402	8	-0.004616	8	-0.282743	8	-0.158063
9	-0.638356	9	-0.634445	9	0.587848	9	0.654109

	OC.D		OC.F		PA.D		PA.F
0	56.289650	0	58.433209	0	142.368465	0	144.492491
1	10.671331	1	9.965477	1	10.457203	1	9.705685
2	-9.866896	2	-9.737512	2	-9.973868	2	-9.852839
3	-10.927277	3	-11.155366	3	-10.935089	3	-10.946510
4	-6.003599	4	-6.330982	4	-5.898739	4	-6.193678
5	-4.433001	5	-3.096941	5	-3.176837	5	-2.085582
6	9.665997	6	10.687323	6	9.656930	6	10.587951
7	10.409222	7	9.811349	7	8.125175	7	7.607769
8	-2.424902	8	-3.039811	8	-2.445778	8	-3.008961
9	-4.137888	9	-4.161691	9	-2.919053	9	-2.941719

TO = 0 CORRESPOND AU 0 JANVIER 1988 à 0 H SOIT LA DATE JULIENNE 2447160.5

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 Hélène (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 Prometheus (4)		70 × 50 × 40		0.6	15.	0.613 0	23	139.353		0.
XVII Pandora (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) : Hélène : 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) : Helene : 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

$$\Delta\alpha \cos\delta = X$$
$$\Delta\delta = Y$$

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

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
Rhéa	16	1.391 0	71
Titan	11	0.394 0	73
Hypérion	8	0.394 0	76
Japet	16	0.079 0	80
	(days)	*(rad/d)*	

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 1 DE SATURNE: MIMAS N=6.667

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
JAN. 1 (0H)	X:	+0.5961	-0.00525	+23.1950	+0.04765	+0.001957	+0,2340
(2447161.5)				5.060111	3.6236	5.5831	4.8354
A JAN. 3 (0H)	Y:	-0.2069	-0.00324	+10.1384	+0.02619	+0.000575	+0.1022
				0.527298	5.1566	0.8341	0.3022
JAN. 3 (0H)	X:	+0.5858	-0.00620	+23.2112	+0.04737	+0.001498	+0.2342
(2447163.5)				5.823918	4.5672	2.1178	0.0494
A JAN. 5 (0H)	Y:	-0.2133	-0.00333	+10.1356	+0.02716	+0.000843	+0.1021
				1.290023	5.9781	2.5223	1.8000
JAN. 5 (0H)	X:	+0.5742	-0.00631	+23.2328	+0.04702	+0.001131	+0.2339
(2447165.5)				0.304669	5.3589	2.6730	1.5483
A JAN. 7 (0H)	Y:	-0.2204	-0.00273	+10.1333	+0.02302	+0.001408	+0.1021
				2.052517	0.6241	5.7784	3.2945
JAN. 7 (0H)	X:	+0.5603	-0.00530	+23.2599	+0.03392	+0.004142	+0.2343
(2447167.5)				1.068423	6.1624	5.8730	3.0432
A JAN. 9 (0H)	Y:	-0.2261	-0.00318	+10.1353	+0.02390	+0.000761	+0.1019
				2.815341	1.2660	2.6451	4.7928
JAN. 9 (0H)	X:	+0.5490	-0.00722	+23.2866	+0.04405	+0.002849	+0.2341
(2447169.5)				1.832712	0.5269	2.7021	4.5426
A JAN.11 (0H)	Y:	-0.2317	-0.00332	+10.1394	+0.02131	+0.001606	+0.1020
				3.578033	1.9585	2.8752	0.0019
JAN.11 (0H)	X:	+0.5364	-0.00747	+23.3185	+0.04175	+0.002744	+0.2347
(2447171.5)				2.596922	1.2254	2.9701	6.0364
A JAN.13 (0H)	Y:	-0.2384	-0.00243	+10.1419	+0.02689	+0.001873	+0.1020
				4.341134	2.8557	5.8612	1.5005
JAN.13 (0H)	X:	+0.5212	-0.00621	+23.3442	+0.04649	+0.003683	+0.2350
(2447173.5)				3.361197	2.2537	5.9186	1.2532
A JAN.15 (0H)	Y:	-0.2440	-0.00278	+10.1479	+0.02426	+0.000115	+0.1021
				5.104032	3.6380	0.2541	2.9938
JAN.15 (0H)	X:	+0.5076	-0.00759	+23.3787	+0.04011	+0.001084	+0.2356
(2447175.5)				4.125533	2.9580	2.9321	2.7492
A JAN.17 (0H)	Y:	-0.2493	-0.00294	+10.1540	+0.02350	+0.000818	+0.1023
				5.866971	4.5173	3.0620	4.4924
JAN.17 (0H)	X:	+0.4928	-0.00771	+23.4136	+0.04027	+0.001016	+0.2360
(2447177.5)				4.889972	3.7333	4.3092	4.2491
A JAN.19 (0H)	Y:	-0.2550	-0.00247	+10.1632	+0.02319	+0.000908	+0.1024
				0.346872	5.2046	6.2740	5.9886
JAN.19 (0H)	X:	+0.4774	-0.00768	+23.4497	+0.04212	+0.001407	+0.2364
(2447179.5)				5.654513	4.5197	0.0184	5.7479
A JAN.21 (0H)	Y:	-0.2599	-0.00271	+10.1728	+0.02566	+0.001003	+0.1025
				1.110093	6.0322	2.2325	1.2034
JAN.21 (0H)	X:	+0.4628	-0.00874	+23.4849	+0.04732	+0.002862	+0.2364
(2447181.5)				0.135957	5.4492	2.5079	0.9631
A JAN.23 (0H)	Y:	-0.2654	-0.00230	+10.1840	+0.02331	+0.000431	+0.1027
				1.873148	0.6469	5.4534	2.7009
JAN.23 (0H)	X:	+0.4450	-0.00761	+23.5296	+0.03523	+0.002737	+0.2370
(2447183.5)				0.900472	6.2703	5.7844	2.4623
A JAN.25 (0H)	Y:	-0.2706	-0.00216	+10.1966	+0.02358	+0.000755	+0.1025
				2.636397	1.5093	5.8164	4.1978
JAN.25 (0H)	X:	+0.4282	-0.00828	+23.5721	+0.03695	+0.000984	+0.2367
(2447185.5)				1.665235	0.8137	6.0611	3.9596
A JAN.27 (0H)	Y:	-0.2744	-0.00277	+10.2148	+0.01921	+0.002072	+0.1029
				3.399689	2.0923	2.7882	5.6940

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 1 DE SATURNE: MIMAS N=6.667

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
JAN.27 (0H)	X:	+0.4129	-0.00995	+23.6228	+0.03715	+0.004946	+0.2378
(2447187.5)				2.430324	1.2507	2.8319	5.4575
A JAN.29 (0H)	Y:	-0.2795	-0.00205	+10.2305	+0.02274	+0.000725	+0.1027
				4.163232	2.9837	5.5691	0.9079
JAN.29 (0H)	X:	+0.3940	-0.00851	+23.6667	+0.04073	+0.002313	+0.2377
(2447189.5)				3.195277	2.3195	5.7190	0.6727
A JAN.31 (0H)	Y:	-0.2843	-0.00175	+10.2496	+0.02443	+0.001581	+0.1032
				4.926982	3.6857	5.9846	2.4033
JAN.31 (0H)	X:	+0.3755	-0.00886	+23.7151	+0.04189	+0.001755	+0.2389
(2447191.5)				3.960468	3.0725	6.0239	2.1708
A FEV. 2 (0H)	Y:	-0.2880	-0.00233	+10.2685	+0.02273	+0.001201	+0.1033
				5.690524	4.6788	2.8229	3.9019
FEV. 2 (0H)	X:	+0.3577	-0.01003	+23.7672	+0.03563	+0.002142	+0.2392
(2447193.5)				4.725582	3.9497	3.1539	3.6709
A FEV. 4 (0H)	Y:	-0.2922	-0.00186	+10.2904	+0.02214	+0.000427	+0.1037
				0.171162	5.3824	6.0273	5.3990
FEV. 4 (0H)	X:	+0.3380	-0.00939	+23.8207	+0.03754	+0.002043	+0.2400
(2447195.5)				5.490962	4.6028	5.8290	5.1709
A FEV. 6 (0H)	Y:	-0.2960	-0.00179	+10.3134	+0.02275	+0.000627	+0.1039
				0.935090	6.1642	1.1649	0.6147
FEV. 6 (0H)	X:	+0.3195	-0.01037	+23.8720	+0.04345	+0.001963	+0.2404
(2447197.5)				6.256375	5.5166	2.1569	0.3872
A FEV. 8 (0H)	Y:	-0.2995	-0.00181	+10.3378	+0.02368	+0.000774	+0.1042
				1.699104	0.6904	2.7156	2.1141
FEV. 8 (0H)	X:	+0.2992	-0.01018	+23.9296	+0.04064	+0.000484	+0.2407
(2447199.5)				0.738663	0.0528	2.9241	1.8886
A FEV.10 (0H)	Y:	-0.3036	-0.00125	+10.3623	+0.02441	+0.001309	+0.1043
				2.463087	1.6853	5.6806	3.6108
FEV.10 (0H)	X:	+0.2774	-0.00944	+23.9885	+0.03655	+0.003592	+0.2411
(2447201.5)				1.504046	1.1039	5.8492	3.3855
A FEV.12 (0H)	Y:	-0.3062	-0.00176	+10.3923	+0.02078	+0.001122	+0.1046
				3.227319	2.3572	2.7541	5.1110
FEV.12 (0H)	X:	+0.2585	-0.01146	+24.0527	+0.03494	+0.003919	+0.2417
(2447203.5)				2.269983	1.5120	2.7641	4.8872
A FEV.14 (0H)	Y:	-0.3089	-0.00165	+10.4224	+0.01951	+0.001033	+0.1047
				3.991570	3.2274	2.9908	0.3228
FEV.14 (0H)	X:	+0.2374	-0.01109	+24.1166	+0.03338	+0.001498	+0.2421
(2447205.5)				3.035780	2.4031	3.2369	0.1002
A FEV.16 (0H)	Y:	-0.3126	-0.00078	+10.4535	+0.02402	+0.002227	+0.1052
				4.756361	3.8270	5.9071	1.8228
FEV.16 (0H)	X:	+0.2143	-0.01002	+24.1764	+0.04412	+0.004095	+0.2433
(2447207.5)				3.801857	3.1931	5.9297	1.6020
A FEV.18 (0H)	Y:	-0.3147	-0.00128	+10.4860	+0.02257	+0.000403	+0.1054
				5.520906	4.7831	2.3228	3.3190
FEV.18 (0H)	X:	+0.1933	-0.01160	+24.2440	+0.03635	+0.001759	+0.2438
(2447209.5)				4.567836	4.1195	2.8885	3.1006
A FEV.20 (0H)	Y:	-0.3168	-0.00125	+10.5190	+0.02395	+0.000737	+0.1060
				0.002513	5.6128	2.8524	4.8191
FEV.20 (0H)	X:	+0.1707	-0.01137	+24.3112	+0.03672	+0.000765	+0.2448
(2447211.5)				5.334033	4.8576	4.8407	4.6024
A FEV.22 (0H)	Y:	-0.3192	-0.00072	+10.5553	+0.02148	+0.000943	+0.1064
				0.767422	0.0990	0.1666	0.0349

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 1 DE SATURNE: MIMAS N=6.667

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
FEV.22 (OH)	X:	+0.1481	-0.01139	+24.3793	+0.03826	+0.001293	+0.2455
(2447213.5)				6.100346	5.6201	0.4739	6.1033
A FEV.24 (OH)	Y:	-0.3207	-0.00095	+10.5920	+0.02364	+0.001097	+0.1067
				1.532569	0.8303	2.4319	1.5354
FEV.24 (OH)	X:	+0.1259	-0.01222	+24.4473	+0.04459	+0.002734	+0.2458
(2447215.5)				0.583613	0.1236	2.5639	1.3215
A FEV.26 (OH)	Y:	-0.3228	-0.00045	+10.6290	+0.02505	+0.000673	+0.1072
				2.297655	1.7800	5.2850	3.0346
FEV.26 (OH)	X:	+0.1008	-0.01098	+24.5206	+0.03994	+0.003177	+0.2468
(2447217.5)				1.349876	1.2062	5.7336	2.8216
A FEV.28 (OH)	Y:	-0.3241	-0.00041	+10.6687	+0.02528	+0.000428	+0.1073
				3.063010	2.5781	5.6431	4.5353
FEV.28 (OH)	X:	+0.0776	-0.01203	+24.5943	+0.03967	+0.000401	+0.2468
(2447219.5)				2.116561	1.8769	2.6571	4.3230
A FEV.30 (OH)	Y:	-0.3244	-0.00085	+10.7122	+0.02035	+0.001908	+0.1078
				3.828327	3.4921	2.8037	6.0325
MAR. 1 (OH)	X:	+0.0552	-0.01318	+24.6754	+0.02944	+0.004458	+0.2480
(2447221.5)				2.883350	2.5821	2.8783	5.8212
A MAR. 3 (OH)	Y:	-0.3258	+0.00006	+10.7542	+0.02397	+0.001441	+0.1081
				4.594176	4.0965	5.8112	1.2506
MAR. 3 (OH)	X:	+0.0292	-0.01142	+24.7466	+0.04328	+0.003735	+0.2484
(2447223.5)				3.650271	3.3575	5.8246	1.0403
A MAR. 5 (OH)	Y:	-0.3265	+0.00017	+10.7993	+0.02274	+0.001250	+0.1087
				5.360066	4.8629	6.1422	2.7471
MAR. 5 (OH)	X:	+0.0048	-0.01219	+24.8250	+0.03990	+0.000981	+0.2497
(2447225.5)				4.417293	4.1708	6.2253	2.5391
A MAR. 7 (OH)	Y:	-0.3260	-0.00031	+10.8424	+0.02684	+0.001540	+0.1092
				6.125979	5.7910	2.7326	4.2493
MAR. 7 (OH)	X:	-0.0192	-0.01305	+24.9030	+0.04092	+0.002123	+0.2506
(2447227.5)				5.184286	5.1148	3.0669	4.0423
A MAR. 9 (OH)	Y:	-0.3262	+0.00036	+10.8897	+0.02378	+0.000626	+0.1097
				0.608935	0.2978	6.2467	5.7482
MAR. 9 (OH)	X:	-0.0449	-0.01220	+24.9838	+0.03689	+0.002123	+0.2516
(2447229.5)				5.951553	5.7965	6.0788	5.5438
A MAR.11 (OH)	Y:	-0.3256	+0.00040	+10.9372	+0.02441	+0.000603	+0.1102
				1.375252	1.0628	1.6206	0.9671
MAR.11 (OH)	X:	-0.0691	-0.01315	+25.0614	+0.04455	+0.002483	+0.2522
(2447231.5)				0.435741	0.2470	2.2998	0.7626
A MAR.13 (OH)	Y:	-0.3248	+0.00050	+10.9855	+0.02556	+0.000683	+0.1108
				2.141693	1.8568	3.1407	2.4686
MAR.13 (OH)	X:	-0.0952	-0.01254	+25.1440	+0.04340	+0.000551	+0.2530
(2447233.5)				1.203065	1.1773	4.8734	2.2657
A MAR.15 (OH)	Y:	-0.3242	+0.00106	+11.0335	+0.02953	+0.001347	+0.1111
				2.908256	2.7101	5.6336	3.9689
MAR.15 (OH)	X:	-0.1218	-0.01206	+25.2249	+0.04839	+0.002929	+0.2533
(2447235.5)				1.970465	2.0956	5.7969	3.7656
A MAR.17 (OH)	Y:	-0.3220	+0.00055	+11.0869	+0.02486	+0.001367	+0.1117
				3.674899	3.6126	2.7190	5.4706
MAR.17 (OH)	X:	-0.1453	-0.01396	+25.3153	+0.03371	+0.004604	+0.2545
(2447237.5)				2.738249	2.8005	2.7933	5.2683
A MAR.19 (OH)	Y:	-0.3202	+0.00099	+11.1387	+0.02644	+0.000291	+0.1119
				4.441796	4.3970	3.2027	0.6868

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 1 DE SATURNE: MIMAS N=6.667

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
MAR.20 (OH)	X:	-0.1856	-0.01194	+25.4387	+0.04529	+0.004397	+0.2555
(2447240.5)				3.890046	3.8432	5.8801	1.2373
A MAR.22 (OH)	Y:	-0.3174	+0.00157	+11.2201	+0.02496	+0.000956	+0.1129
				5.592685	5.4760	0.0431	2.9364
MAR.22 (OH)	X:	-0.2111	-0.01288	+25.5256	+0.04237	+0.000537	+0.2567
(2447242.5)				4.658003	4.7412	0.5928	2.7367
A MAR.24 (OH)	Y:	-0.3139	+0.00117	+11.2723	+0.03006	+0.001726	+0.1136
				0.076837	0.0041	2.7287	4.4400
MAR.24 (OH)	X:	-0.2363	-0.01346	+25.6102	+0.04601	+0.002102	+0.2578
(2447244.5)				5.425993	5.6210	3.0068	4.2409
A MAR.26 (OH)	Y:	-0.3112	+0.00196	+11.3286	+0.02689	+0.000741	+0.1142
				0.844317	0.8664	6.1985	5.9402
MAR.26 (OH)	X:	-0.2629	-0.01247	+25.6981	+0.04011	+0.002101	+0.2588
(2447246.5)				6.194223	0.0922	6.1799	5.7432
A MAR.28 (OH)	Y:	-0.3075	+0.00196	+11.3845	+0.02725	+0.000574	+0.1148
				1.612013	1.6158	1.9063	1.1605
MAR.28 (OH)	X:	-0.2877	-0.01335	+25.7820	+0.04571	+0.002699	+0.2595
(2447248.5)				0.679402	0.7520	2.4010	0.9632
A MAR.30 (OH)	Y:	-0.3036	+0.00214	+11.4406	+0.02852	+0.000612	+0.1154
				2.379827	2.3996	3.4747	2.6631
MAR.30 (OH)	X:	-0.3143	-0.01248	+25.8692	+0.04785	+0.001075	+0.2605
(2447250.5)				1.447662	1.7039	5.1627	2.4668
A MAR.32 (OH)	Y:	-0.2996	+0.00269	+11.4964	+0.03231	+0.001387	+0.1157
				3.147799	3.1858	5.6761	4.1653
AVR. 1 (OH)	X:	-0.3407	-0.01210	+25.9542	+0.05304	+0.002586	+0.2607
(2447252.5)				2.216076	2.5349	5.7837	3.9683
A AVR. 3 (OH)	Y:	-0.2940	+0.00220	+11.5565	+0.02947	+0.001488	+0.1165
				3.915754	4.1519	2.6498	5.6676
AVR. 3 (OH)	X:	-0.3640	-0.01381	+26.0491	+0.03843	+0.004733	+0.2621
(2447254.5)				2.984739	3.4375	2.7830	5.4708
A AVR. 5 (OH)	Y:	-0.2890	+0.00280	+11.6147	+0.03030	+0.000104	+0.1167
				4.684070	4.8770	5.7558	0.8861
AVR. 5 (OH)	X:	-0.3903	-0.01224	+26.1338	+0.04575	+0.001581	+0.2623
(2447256.5)				3.753474	4.0916	5.6695	0.6893
A AVR. 7 (OH)	Y:	-0.2841	+0.00355	+11.6759	+0.02584	+0.002236	+0.1176
				5.452698	5.5797	6.0611	2.3870
AVR. 7 (OH)	X:	-0.4165	-0.01156	+26.2206	+0.04353	+0.003756	+0.2640
(2447258.5)				4.522477	4.7399	6.0863	2.1912
A AVR. 9 (OH)	Y:	-0.2773	+0.00291	+11.7333	+0.03212	+0.001590	+0.1180
				6.221237	0.1120	2.5949	3.8901
AVR. 9 (OH)	X:	-0.4399	-0.01300	+26.3063	+0.05109	+0.003198	+0.2646
(2447260.5)				5.291259	5.7223	2.7658	3.6947
A AVR.11 (OH)	Y:	-0.2708	+0.00339	+11.7932	+0.03092	+0.000479	+0.1189
				0.706855	0.9098	2.8760	5.3915
AVR.11 (OH)	X:	-0.4650	-0.01187	+26.3937	+0.04523	+0.000976	+0.2660
(2447262.5)				6.060346	0.2180	5.8003	5.1977
A AVR.13 (OH)	Y:	-0.2641	+0.00393	+11.8536	+0.03093	+0.000839	+0.1195
				1.475683	1.7828	0.0949	0.6127
AVR.13 (OH)	X:	-0.4888	-0.01187	+26.4788	+0.04563	+0.001173	+0.2669
(2447264.5)				0.546334	0.9542	1.4408	0.4185
A AVR.15 (OH)	Y:	-0.2564	+0.00373	+11.9139	+0.02956	+0.001096	+0.1202
				2.244803	2.5016	2.8681	2.1164

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DU SATELLITE 1 DE SATURNE: MIMAS N=6.667

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
AVR.15 (OH)	X:	-0.5122	-0.01199	+26.5633	+0.04667	+0.002094	+0.2676
(2447266.5)				1.315592	1.6944	2.8913	1.9232
A AVR.17 (OH)	Y:	-0.2491	+0.00441	+11.9722	+0.03404	+0.001303	+0.1207
				3.013969	3.2637	5.4842	3.6195
AVR.17 (OH)	X:	-0.5372	-0.01046	+26.6449	+0.05804	+0.003958	+0.2683
(2447268.5)				2.084720	2.6014	5.6940	3.4249
A AVR.19 (OH)	Y:	-0.2404	+0.00428	+12.0335	+0.03305	+0.000203	+0.1213
				3.783234	4.1285	1.4667	5.1245
AVR.19 (OH)	X:	-0.5586	-0.01175	+26.7333	+0.04711	+0.002213	+0.2690
(2447270.5)				2.854211	3.4575	2.6751	4.9301
A AVR.21 (OH)	Y:	-0.2311	+0.00419	+12.0940	+0.03512	+0.001491	+0.1217
				4.552515	5.0211	2.6371	0.3420
AVR.21 (OH)	X:	-0.5801	-0.01155	+26.8189	+0.04826	+0.002493	+0.2696
(2447272.5)				3.623641	4.3544	2.8465	0.1467
A AVR.23 (OH)	Y:	-0.2229	+0.00532	+12.1560	+0.02880	+0.002200	+0.1225
				5.322353	5.6994	5.9950	1.8470
AVR.23 (OH)	X:	-0.6039	-0.00938	+26.8980	+0.04438	+0.005203	+0.2709
(2447274.5)				4.393494	4.8301	6.0036	1.6518
A AVR.25 (OH)	Y:	-0.2131	+0.00503	+12.2159	+0.03164	+0.000430	+0.1229
				6.092032	0.2417	1.4994	3.3476
AVR.25 (OH)	X:	-0.6241	-0.01053	+26.9791	+0.04974	+0.001594	+0.2716
(2447276.5)				5.163103	5.7887	2.3273	3.1529
A AVR.27 (OH)	Y:	-0.2024	+0.00483	+12.2737	+0.03368	+0.001906	+0.1238
				0.578806	0.9311	2.8387	4.8524
AVR.27 (OH)	X:	-0.6441	-0.01031	+27.0564	+0.05159	+0.001977	+0.2730
(2447278.5)				5.932871	0.2793	2.9795	4.6579
A AVR.29 (OH)	Y:	-0.1925	+0.00574	+12.3339	+0.03352	+0.001121	+0.1244
				1.348685	1.8713	5.9666	0.0724
AVR.29 (OH)	X:	-0.6646	-0.00903	+27.1358	+0.04676	+0.001931	+0.2737
(2447280.5)				0.419561	1.1579	6.2661	6.1617
A AVR.31 (OH)	Y:	-0.1813	+0.00558	+12.3926	+0.03187	+0.000533	+0.1251
				2.118842	2.6153	2.4457	1.5774
MAI 1 (OH)	X:	-0.6826	-0.00963	+27.2100	+0.04503	+0.002809	+0.2744
(2447282.5)				1.189595	1.7898	2.6144	1.3832
A MAI 3 (OH)	Y:	-0.1702	+0.00587	+12.4499	+0.03304	+0.000535	+0.1257
				2.889060	3.3739	4.5061	3.0819
MAI 3 (OH)	X:	-0.7021	-0.00812	+27.2822	+0.05448	+0.002387	+0.2753
(2447284.5)				1.959443	2.6603	5.4432	2.8871
A MAI 5 (OH)	Y:	-0.1588	+0.00628	+12.5064	+0.03442	+0.001335	+0.1261
				3.659414	4.1146	5.9113	4.5870
MAI 5 (OH)	X:	-0.7196	-0.00791	+27.3537	+0.05444	+0.001773	+0.2754
(2447286.5)				2.729519	3.4413	5.9340	4.3913
A MAI 7 (OH)	Y:	-0.1458	+0.00575	+12.5640	+0.03697	+0.001870	+0.1268
				4.429595	5.0791	2.5170	6.0898
MAI 7 (OH)	X:	-0.7340	-0.00899	+27.4312	+0.05125	+0.004688	+0.2765
(2447288.5)				3.499566	4.5099	2.6949	5.8930
A MAI 9 (OH)	Y:	-0.1338	+0.00658	+12.6204	+0.03317	+0.000700	+0.1270
				5.200251	5.8055	6.0819	1.3120
MAI 9 (OH)	X:	-0.7512	-0.00658	+27.4964	+0.04690	+0.003225	+0.2767
(2447290.5)				4.269927	5.0418	5.9861	1.1146
A MAI 11 (OH)	Y:	-0.1216	+0.00701	+12.6779	+0.03015	+0.001631	+0.1278
				5.970917	0.3940	6.1173	2.8129

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DU SATELLITE 1 DE SATURNE: MIMAS N=6.667

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
MAI 11 (OH)	X:	-0.7663	-0.00620	+27.5645	+0.04327	+0.002444	+0.2780
(2447292.5)				5.040298	5.8770	0.0683	2.6156
A MAI 13 (OH)	Y:	-0.1075	+0.00625	+12.7291	+0.03386	+0.002314	+0.1283
				0.458529	1.0074	2.7873	4.3190
MAI 13 (OH)	X:	-0.7784	-0.00715	+27.6247	+0.05373	+0.004115	+0.2787
(2447294.5)				5.810532	0.3446	2.8074	4.1212
A MAI 15 (OH)	Y:	-0.0943	+0.00694	+12.7827	+0.03312	+0.000358	+0.1290
				1.229334	1.9013	4.8410	5.8211
MAI 15 (OH)	X:	-0.7919	-0.00533	+27.6882	+0.04784	+0.001523	+0.2797
(2447296.5)				0.297763	1.2736	5.8223	5.6242
A MAI 17 (OH)	Y:	-0.0807	+0.00723	+12.8341	+0.03411	+0.000863	+0.1297
				2.000181	2.7202	6.1611	1.0443
MAI 17 (OH)	X:	-0.8028	-0.00529	+27.7460	+0.04510	+0.001156	+0.2803
(2447298.5)				1.068255	2.0002	2.0041	0.8461
A MAI 19 (OH)	Y:	-0.0663	+0.00695	+12.8849	+0.03121	+0.000850	+0.1302
				2.771216	3.5116	3.0711	2.5491
MAI 19 (OH)	X:	-0.8131	-0.00473	+27.8010	+0.04601	+0.001109	+0.2809
(2447300.5)				1.838716	2.7731	3.4820	2.3513
A MAI 21 (OH)	Y:	-0.0526	+0.00758	+12.9319	+0.03290	+0.001609	+0.1306
				3.542317	4.1810	5.7520	4.0540
MAI 21 (OH)	X:	-0.8238	-0.00310	+27.8493	+0.05508	+0.004244	+0.2810
(2447302.5)				2.609135	3.4739	5.8068	3.8541
A MAI 23 (OH)	Y:	-0.0375	+0.00715	+12.9802	+0.03461	+0.000924	+0.1312
				4.313284	5.0981	2.0937	5.5596
MAI 23 (OH)	X:	-0.8298	-0.00432	+27.9061	+0.05082	+0.003453	+0.2818
(2447304.5)				3.379639	4.5443	2.5218	5.3591
A MAI 25 (OH)	Y:	-0.0224	+0.00719	+13.0255	+0.03616	+0.001298	+0.1313
				5.084376	5.8929	2.5794	0.7796
MAI 25 (OH)	X:	-0.8366	-0.00307	+27.9528	+0.05161	+0.001120	+0.2816
(2447306.5)				4.150176	5.2867	2.4709	0.5775
A MAI 27 (OH)	Y:	-0.0085	+0.00814	+13.0733	+0.02921	+0.002233	+0.1320
				5.855735	0.5299	5.9470	2.2840
MAI 27 (OH)	X:	-0.8441	-0.00093	+27.9984	+0.03720	+0.004922	+0.2829
(2447308.5)				4.921036	6.0451	6.0926	2.0814
A MAI 29 (OH)	Y:	+0.0070	+0.00740	+13.1143	+0.03178	+0.001144	+0.1321
				0.343829	1.1888	2.7340	3.7876
MAI 29 (OH)	X:	-0.8470	-0.00215	+28.0370	+0.04864	+0.003338	+0.2829
(2447310.5)				5.691545	0.4952	2.6581	3.5844
A MAI 31 (OH)	Y:	+0.0226	+0.00730	+13.1547	+0.02972	+0.001556	+0.1330
				1.115294	1.9320	3.1146	5.2913
MAI 31 (OH)	X:	-0.8500	-0.00110	+28.0738	+0.04597	+0.001436	+0.2841
(2447312.5)				0.179038	1.3201	3.3221	5.0883
A JUN. 2 (OH)	Y:	+0.0373	+0.00803	+13.1936	+0.03354	+0.001704	+0.1333
				1.886527	2.8228	5.8969	0.5135
JUN. 2 (OH)	X:	-0.8522	+0.00020	+28.1093	+0.04609	+0.001886	+0.2843
(2447314.5)				0.949674	2.2326	6.1963	0.3097
A JUN. 4 (OH)	Y:	+0.0530	+0.00752	+13.2312	+0.02969	+0.000559	+0.1339
				2.658004	3.6462	2.5557	2.0184
JUN. 4 (OH)	X:	-0.8518	-0.00008	+28.1394	+0.03898	+0.002292	+0.2847
(2447316.5)				1.720424	2.9881	2.7503	1.8146
A JUN. 6 (OH)	Y:	+0.0681	+0.00777	+13.2651	+0.02939	+0.000692	+0.1342
				3.429476	4.3651	5.3912	3.5237

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DU SATELLITE 1 DE SATURNE: MIMAS N=6.667

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
JUN. 6 (0H)	X:	-0.8524	+0.00183	+28.1619	+0.04757	+0.003544	+0.2850
(2447318.5)				2.490964	3.6213	5.6856	3.3179
A JUN. 8 (0H)	Y:	+0.0833	+0.00780	+13.2979	+0.02910	+0.000905	+0.1345
				4.200941	5.1463	0.0894	5.0299
JUN. 8 (0H)	X:	-0.8496	+0.00171	+28.1872	+0.04554	+0.000951	+0.2848
(2447320.5)				3.261617	4.5247	0.7428	4.8233
A JUN.10 (0H)	Y:	+0.0995	+0.00712	+13.3279	+0.03481	+0.002313	+0.1347
				4.972188	5.9878	2.5612	0.2493
JUN.10 (0H)	X:	-0.8444	+0.00130	+28.2110	+0.05391	+0.004624	+0.2850
(2447322.5)				4.032074	5.4800	2.5990	0.0406
A JUN.12 (0H)	Y:	+0.1139	+0.00793	+13.3588	+0.02871	+0.001176	+0.1350
				5.743800	0.6137	5.7911	1.7557
JUN.12 (0H)	X:	-0.8417	+0.00412	+28.2271	+0.03663	+0.004090	+0.2851
(2447324.5)				4.802952	6.2635	6.0283	1.5461
A JUN.14 (0H)	Y:	+0.1288	+0.00778	+13.3866	+0.02957	+0.000883	+0.1351
				0.232054	1.4646	5.8542	3.2566
JUN.14 (0H)	X:	-0.8354	+0.00396	+28.2415	+0.04037	+0.000735	+0.2854
(2447326.5)				5.573548	0.8133	0.8247	3.0462
A JUN.16 (0H)	Y:	+0.1448	+0.00685	+13.4089	+0.02530	+0.002453	+0.1356
				1.003751	2.0584	2.9737	4.7627
JUN.16 (0H)	X:	-0.8267	+0.00349	+28.2459	+0.04071	+0.004166	+0.2859
(2447328.5)				0.060945	1.4065	2.9699	4.5515
A JUN.18 (0H)	Y:	+0.1591	+0.00751	+13.4313	+0.02889	+0.001211	+0.1358
				1.775151	2.9675	5.5919	6.2652
JUN.18 (0H)	X:	-0.8190	+0.00554	+28.2538	+0.04394	+0.002488	+0.2861
(2447330.5)				0.831469	2.4335	5.8111	6.0541
A JUN.20 (0H)	Y:	+0.1736	+0.00731	+13.4504	+0.02807	+0.000850	+0.1363
				2.546632	3.7728	0.0308	1.4878
JUN.20 (0H)	X:	-0.8082	+0.00538	+28.2547	+0.03756	+0.001138	+0.2862
(2447332.5)				1.602060	3.2605	2.1145	1.2755
A JUN.22 (0H)	Y:	+0.1882	+0.00687	+13.4680	+0.02622	+0.000626	+0.1365
				3.318130	4.6479	2.9890	2.9926
JUN.22 (0H)	X:	-0.7974	+0.00633	+28.2502	+0.03797	+0.000801	+0.2863
(2447334.5)				2.372493	3.9695	5.0970	2.7796
A JUN.24 (0H)	Y:	+0.2017	+0.00719	+13.4815	+0.02331	+0.001444	+0.1365
				4.089667	5.3321	5.9481	4.4978
JUN.24 (0H)	X:	-0.7859	+0.00758	+28.2401	+0.03668	+0.003600	+0.2856
(2447336.5)				3.142915	4.5912	6.0100	4.2829
A JUN.26 (0H)	Y:	+0.2163	+0.00636	+13.4933	+0.02875	+0.001730	+0.1367
				4.860875	6.1520	2.4232	6.0020
JUN.26 (0H)	X:	-0.7699	+0.00631	+28.2358	+0.04854	+0.004839	+0.2860
(2447338.5)				3.913094	5.6477	2.5111	5.7856
A JUN.28 (0H)	Y:	+0.2297	+0.00643	+13.5029	+0.02723	+0.000866	+0.1365
				5.632264	0.6827	2.9421	1.2234
JUN.28 (0H)	X:	-0.7558	+0.00816	+28.2212	+0.04020	+0.000268	+0.2850
(2447340.5)				4.683470	0.1570	0.7717	1.0052
A JUN.30 (0H)	Y:	+0.2418	+0.00694	+13.5139	+0.02800	+0.002258	+0.1368
				0.120382	1.7448	5.7731	2.7253
JUN.30 (0H)	X:	-0.7413	+0.00968	+28.2086	+0.03684	+0.003978	+0.2856
(2447342.5)				5.453875	1.2581	6.0329	2.5061
A JUL. 2 (0H)	Y:	+0.2553	+0.00574	+13.5168	+0.02291	+0.001689	+0.1366
				0.891804	2.3553	2.9768	4.2302

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DU SATELLITE 1 DE SATURNE: MIMAS N=6.667

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
JUL. 2 (OH)	X:	-0.7224	+0.00822	+28.1827	+0.03488	+0.004259	+0.2851
(2447344.5)				6.224001	1.6946	2.8738	4.0097
A JUL. 4 (OH)	Y:	+0.2677	+0.00568	+13.5199	+0.02231	+0.000810	+0.1370
				1.663134	3.2416	3.5828	5.7316
JUL. 4 (OH)	X:	-0.7045	+0.00961	+28.1592	+0.03670	+0.001004	+0.2855
(2447346.5)				0.710960	2.6547	4.5641	5.5112
A JUL. 6 (OH)	Y:	+0.2789	+0.00603	+13.5188	+0.02531	+0.001979	+0.1370
				2.434230	3.9507	6.0375	0.9539
JUL. 6 (OH)	X:	-0.6855	+0.01046	+28.1317	+0.03901	+0.002037	+0.2852
(2447348.5)				1.480975	3.5008	6.2829	0.7320
A JUL. 8 (OH)	Y:	+0.2906	+0.00519	+13.5175	+0.02412	+0.000844	+0.1371
				3.205418	4.9370	2.4733	2.4573
JUL. 8 (OH)	X:	-0.6646	+0.01016	+28.1002	+0.03517	+0.001651	+0.2850
(2447350.5)				2.250997	4.4399	2.6801	2.2355
A JUL.10 (OH)	Y:	+0.3010	+0.00530	+13.5116	+0.02094	+0.000717	+0.1370
				3.976577	5.7034	5.6203	3.9619
JUL.10 (OH)	X:	-0.6449	+0.01185	+28.0595	+0.02921	+0.003733	+0.2844
(2447352.5)				3.020846	4.9489	5.8484	3.7374
A JUL.12 (OH)	Y:	+0.3115	+0.00488	+13.5040	+0.02192	+0.000415	+0.1370
				4.747534	0.2059	1.3648	5.4669
JUL.12 (OH)	X:	-0.6217	+0.01107	+28.0243	+0.03712	+0.001981	+0.2840
(2447354.5)				3.790546	5.8924	2.1056	5.2416
A JUL.14 (OH)	Y:	+0.3219	+0.00414	+13.4922	+0.02400	+0.002282	+0.1366
				5.518341	0.8374	2.7484	0.6857
JUL.14 (OH)	X:	-0.5976	+0.01100	+27.9828	+0.04237	+0.004135	+0.2830
(2447356.5)				4.560064	0.3150	2.6658	0.4577
A JUL.16 (OH)	Y:	+0.3301	+0.00481	+13.4837	+0.02567	+0.001920	+0.1367
				0.006029	1.9639	5.6214	2.1901
JUL.16 (OH)	X:	-0.5762	+0.01349	+27.9422	+0.03817	+0.004617	+0.2830
(2447358.5)				5.329897	1.5685	5.8998	1.9610
A JUL.18 (OH)	Y:	+0.3388	+0.00410	+13.4690	+0.02455	+0.000503	+0.1362
				0.776772	2.7084	5.2913	3.6909
JUL.18 (OH)	X:	-0.5509	+0.01246	+27.8935	+0.03644	+0.001004	+0.2821
(2447360.5)				6.099324	2.1860	2.8461	3.4603
A JUL.20 (OH)	Y:	+0.3476	+0.00315	+13.4522	+0.01913	+0.002069	+0.1364
				1.547706	3.6791	3.0220	5.1942
JUL.20 (OH)	X:	-0.5247	+0.01212	+27.8393	+0.02985	+0.003269	+0.2824
(2447362.5)				0.585609	3.0141	3.1397	4.9629
A JUL.22 (OH)	Y:	+0.3544	+0.00371	+13.4326	+0.02240	+0.001766	+0.1361
				2.318183	4.2861	5.8979	0.4132
JUL.22 (OH)	X:	-0.5000	+0.01379	+27.7874	+0.03897	+0.003235	+0.2817
(2447364.5)				1.354804	3.7630	5.9639	0.1811
A JUL.24 (OH)	Y:	+0.3613	+0.00312	+13.4114	+0.02220	+0.000610	+0.1362
				3.088727	5.1914	0.7231	1.9164
JUL.24 (OH)	X:	-0.4728	+0.01313	+27.7312	+0.03765	+0.001433	+0.2814
(2447366.5)				2.124049	4.7591	2.0674	1.6837
A JUL.26 (OH)	Y:	+0.3675	+0.00264	+13.3883	+0.02274	+0.000666	+0.1359
				3.859163	6.0754	3.0225	3.4199
JUL.26 (OH)	X:	-0.4466	+0.01394	+27.6686	+0.03216	+0.001192	+0.2808
(2447368.5)				2.893087	5.5129	5.5924	3.1854
A JUL.28 (OH)	Y:	+0.3726	+0.00271	+13.3623	+0.02019	+0.000966	+0.1356
				4.629562	0.6860	5.9143	4.9238

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DU SATELLITE 1 DE SATURNE: MIMAS N=6.667

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
JUL.28 (0H) (2447370.5)	X:	-0.4197	+0.01435	+27.6051 3.662047	+0.02939 0.0752	+0.002094 6.1978	+0.2796 4.6880
A JUL.30 (0H)	Y:	+0.3784	+0.00170	+13.3327 5.399594	+0.02090 1.2017	+0.002082 2.6573	+0.1353 0.1423
JUL.30 (0H) (2447372.5)	X:	-0.3898	+0.01288	+27.5428 4.430583	+0.03999 0.5700	+0.005447 2.6262	+0.2792 6.1872
A JUL.32 (0H)	Y:	+0.3822	+0.00189	+13.3041 6.169720	+0.02211 2.1642	+0.000542 4.4352	+0.1348 1.6464
AOU. 1 (0H) (2447374.5)	X:	-0.3630	+0.01474	+27.4774 5.199421	+0.03800 1.6921	+0.001627 5.6520	+0.2779 1.4064
A AOU. 3 (0H)	Y:	+0.3851	+0.00201	+13.2749 0.656374	+0.02733 2.9743	+0.002271 5.7333	+0.1345 3.1452
AOU. 3 (0H) (2447376.5)	X:	-0.3356	+0.01523	+27.4135 5.968013	+0.04543 2.5453	+0.003294 5.8810	+0.2776 2.9036
A AOU. 5 (0H)	Y:	+0.3891	+0.00066	+13.2406 1.426494	+0.02117 3.9983	+0.001884 2.9147	+0.1341 4.6492
AOU. 5 (0H) (2447378.5)	X:	-0.3050	+0.01342	+27.3370 0.453333	+0.03170 3.4070	+0.004285 2.9608	+0.2769 4.4062
A AOU. 7 (0H)	Y:	+0.3913	+0.00078	+13.2062 2.196247	+0.02305 4.7436	+0.000264 4.8024	+0.1338 6.1479
AOU. 7 (0H) (2447380.5)	X:	-0.2768	+0.01469	+27.2659 1.221637	+0.03859 4.1221	+0.001552 5.5465	+0.2765 5.9046
A AOU. 9 (0H)	Y:	+0.3925	+0.00089	+13.1677 2.965862	+0.02116 5.4513	+0.001709 6.2366	+0.1336 1.3683
AOU. 9 (0H) (2447382.5)	X:	-0.2479	+0.01482	+27.1912 1.989811	+0.03976 4.9258	+0.001884 0.2986	+0.2759 1.1235
A AOU.11 (0H)	Y:	+0.3940	+0.00000	+13.1302 3.735389	+0.02512 0.0516	+0.001182 2.6516	+0.1333 2.8694
AOU.11 (0H) (2447384.5)	X:	-0.2183	+0.01429	+27.1147 2.757910	+0.04194 5.8323	+0.001467 2.6924	+0.2752 2.6243
A AOU.13 (0H)	Y:	+0.3940	+0.00011	+13.0894 4.504892	+0.02342 0.9806	+0.000709 5.3880	+0.1329 4.3721
AOU.13 (0H) (2447386.5)	X:	-0.1905	+0.01534	+27.0322 3.525894	+0.03390 0.4931	+0.003072 5.8371	+0.2740 4.1245
A AOU.15 (0H)	Y:	+0.3942	-0.00048	+13.0466 5.274075	+0.02245 1.6773	+0.000640 2.4878	+0.1325 5.8743
AOU.15 (0H) (2447388.5)	X:	-0.1597	+0.01391	+26.9548 4.293492	+0.03849 0.9979	+0.003130 2.5062	+0.2735 5.6255
A AOU.17 (0H)	Y:	+0.3939	-0.00100	+13.0015 6.043191	+0.01995 2.4274	+0.001646 2.9354	+0.1317 1.0921
AOU.17 (0H) (2447390.5)	X:	-0.1301	+0.01398	+26.8725 5.061064	+0.03624 1.7684	+0.002792 2.8744	+0.2717 0.8407
A AOU.19 (0H)	Y:	+0.3915	-0.00038	+12.9600 0.528870	+0.02797 3.1968	+0.002488 5.6891	+0.1315 2.5927
AOU.19 (0H) (2447392.5)	X:	-0.1033	+0.01575	+26.7978 5.828717	+0.05174 2.7334	+0.005199 5.8195	+0.2716 2.3399
A AOU.21 (0H)	Y:	+0.3899	-0.00132	+12.9132 1.297805	+0.02480 4.0939	+0.000147 3.4755	+0.1306 4.0932
AOU.21 (0H) (2447394.5)	X:	-0.0732	+0.01393	+26.7115 0.312895	+0.04122 3.5654	+0.001776 2.9427	+0.2701 3.8384
A AOU.23 (0H)	Y:	+0.3881	-0.00199	+12.8674 2.066728	+0.02728 5.0631	+0.001702 2.8915	+0.1305 5.5922

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DU SATELLITE 1 DE SATURNE: MIMAS N=6.667

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
AOU.23 (OH)	X:	-0.0437	+0.01361	+26.6266	+0.04260	+0.002261	+0.2701
(2447396.5)				1.080269	4.4797	3.1579	5.3370
A AOU.25 (OH)	Y:	+0.3843	-0.00139	+12.8172	+0.02318	+0.001827	+0.1298
				2.835239	5.7141	6.0757	0.8103
AOU.25 (OH)	X:	-0.0163	+0.01474	+26.5422	+0.04207	+0.003285	+0.2690
(2447398.5)				1.847276	5.0822	6.1358	0.5536
A AOU.27 (OH)	Y:	+0.3810	-0.00205	+12.7680	+0.02601	+0.000547	+0.1296
				3.603741	0.2642	1.8041	2.3100
AOU.27 (OH)	X:	+0.0126	+0.01365	+26.4577	+0.04804	+0.001751	+0.2685
(2447400.5)				2.614323	5.9768	2.2756	2.0532
A AOU.29 (OH)	Y:	+0.3769	-0.00235	+12.7175	+0.02711	+0.000718	+0.1291
				4.372095	1.0853	3.3860	3.8114
AOU.29 (OH)	X:	+0.0397	+0.01415	+26.3683	+0.04400	+0.001317	+0.2675
(2447402.5)				3.381215	0.6055	5.4006	3.5523
A AOU.31 (OH)	Y:	+0.3721	-0.00234	+12.6657	+0.02735	+0.000677	+0.1285
				5.140335	1.9571	5.7189	5.3129
AOU.31 (OH)	X:	+0.0673	+0.01381	+26.2816	+0.04438	+0.000717	+0.2664
(2447404.5)				4.147912	1.3877	0.0447	5.0530
A SEP. 2 (OH)	Y:	+0.3678	-0.00317	+12.6104	+0.02206	+0.001869	+0.1279
				5.908305	2.6948	2.7445	0.5287
SEP. 2 (OH)	X:	+0.0964	+0.01233	+26.1930	+0.03700	+0.004934	+0.2653
(2447406.5)				4.914230	1.9311	2.7355	0.2659
A SEP. 4 (OH)	Y:	+0.3616	-0.00274	+12.5589	+0.02695	+0.001085	+0.1273
				0.392973	3.4371	5.4176	2.0306
SEP. 4 (OH)	X:	+0.1215	+0.01401	+26.1103	+0.05061	+0.003194	+0.2643
(2447408.5)				5.680820	2.8592	5.6719	1.7665
A SEP. 6 (OH)	Y:	+0.3552	-0.00279	+12.5053	+0.02763	+0.001873	+0.1265
				1.160567	4.1236	5.8424	3.5270
SEP. 6 (OH)	X:	+0.1474	+0.01359	+26.0259	+0.05163	+0.002577	+0.2632
(2447410.5)				0.163885	3.5812	5.8551	3.2609
A SEP. 8 (OH)	Y:	+0.3498	-0.00395	+12.4515	+0.03046	+0.002111	+0.1261
				1.928458	5.1816	2.7689	5.0281
SEP. 8 (OH)	X:	+0.1752	+0.01166	+25.9345	+0.04895	+0.004181	+0.2628
(2447412.5)				0.930249	4.6436	2.9127	4.7609
A SEP.10 (OH)	Y:	+0.3427	-0.00352	+12.3960	+0.02844	+0.000425	+0.1254
				2.695862	5.8866	6.0131	0.2416
SEP.10 (OH)	X:	+0.1998	+0.01282	+25.8487	+0.04786	+0.001940	+0.2618
(2447414.5)				1.696235	5.2621	5.9093	6.2568
A SEP.12 (OH)	Y:	+0.3352	-0.00345	+12.3386	+0.02668	+0.001247	+0.1251
				3.463233	0.4447	0.0637	1.7420
SEP.12 (OH)	X:	+0.2248	+0.01243	+25.7612	+0.04905	+0.001427	+0.2613
(2447416.5)				2.462159	6.0648	0.6170	1.4731
A SEP.14 (OH)	Y:	+0.3280	-0.00414	+12.2830	+0.02958	+0.001284	+0.1245
				4.230378	1.1534	2.8934	3.2407
SEP.14 (OH)	X:	+0.2494	+0.01175	+25.6743	+0.05265	+0.001445	+0.2605
(2447418.5)				3.227997	0.6000	3.0141	2.9711
A SEP.16 (OH)	Y:	+0.3198	-0.00390	+12.2261	+0.03091	+0.000812	+0.1240
				4.997508	2.0464	5.2955	4.7410
SEP.16 (OH)	X:	+0.2723	+0.01229	+25.5853	+0.05272	+0.002466	+0.2592
(2447420.5)				3.993761	1.5353	5.6985	4.4698
A SEP.18 (OH)	Y:	+0.3120	-0.00441	+12.1670	+0.02755	+0.000734	+0.1234
				5.764333	2.8363	2.5730	6.2399

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DU SATELLITE 1 DE SATURNE: MIMAS N=6.667

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
SEP.18 (OH)	X:	+0.2974	+0.01060	+25.4989	+0.04412	+0.003452	+0.2586
(2447422.5)				4.759062	2.1432	2.6465	5.9671
A SEP.20 (OH)	Y:	+0.3037	-0.00457	+12.1086	+0.02711	+0.000857	+0.1225
				0.247904	3.6611	3.0430	1.4566
SEP.20 (OH)	X:	+0.3201	+0.01088	+25.4129	+0.04614	+0.001232	+0.2568
(2447424.5)				5.524492	2.9823	3.2518	1.1817
A SEP.22 (OH)	Y:	+0.2940	-0.00394	+12.0526	+0.02921	+0.002517	+0.1221
				1.014231	4.2109	5.8042	2.9530
SEP.22 (OH)	X:	+0.3402	+0.01203	+25.3358	+0.05759	+0.005248	+0.2566
(2447426.5)				0.006597	3.6024	5.8393	2.6767
A SEP.24 (OH)	Y:	+0.2856	-0.00485	+11.9945	+0.03057	+0.000792	+0.1212
				1.780828	5.1825	2.5596	4.4527
SEP.24 (OH)	X:	+0.3634	+0.00981	+25.2479	+0.05281	+0.002585	+0.2551
(2447428.5)				0.771871	4.6145	2.8131	4.1746
A SEP.26 (OH)	Y:	+0.2768	-0.00511	+11.9385	+0.03391	+0.001471	+0.1208
				2.547195	5.9630	2.7806	5.9475
SEP.26 (OH)	X:	+0.3848	+0.00968	+25.1658	+0.05652	+0.001636	+0.2550
(2447430.5)				1.537051	5.3951	3.0486	5.6693
A SEP.28 (OH)	Y:	+0.2666	-0.00441	+11.8780	+0.02866	+0.001721	+0.1201
				3.313339	0.5345	6.1066	1.1642
SEP.28 (OH)	X:	+0.4041	+0.01050	+25.0824	+0.04961	+0.002999	+0.2540
(2447432.5)				2.301905	6.1270	6.2137	0.8845
A SEP.30 (OH)	Y:	+0.2572	-0.00498	+11.8205	+0.03106	+0.000641	+0.1197
				4.079355	1.2534	2.4814	2.6604
SEP.30 (OH)	X:	+0.4245	+0.00922	+25.0024	+0.05645	+0.001849	+0.2535
(2447434.5)				3.066810	0.6060	2.5769	2.3812
A OCT. 2 (OH)	Y:	+0.2473	-0.00505	+11.7625	+0.03195	+0.000679	+0.1191
				4.845233	2.0485	3.7666	4.1597
OCT. 2 (OH)	X:	+0.4426	+0.00954	+24.9199	+0.05752	+0.001541	+0.2525
(2447436.5)				3.831638	1.5070	5.1935	3.8785
A OCT. 4 (OH)	Y:	+0.2372	-0.00496	+11.7042	+0.03263	+0.000557	+0.1186
				5.610973	2.8741	5.8050	5.6583
OCT. 4 (OH)	X:	+0.4614	+0.00883	+24.8405	+0.05486	+0.000128	+0.2517
(2447438.5)				4.596201	2.2634	1.5514	5.3769
A OCT. 6 (OH)	Y:	+0.2276	-0.00549	+11.6440	+0.02930	+0.001462	+0.1178
				0.093377	3.7615	2.6852	0.8722
OCT. 6 (OH)	X:	+0.4806	+0.00761	+24.7589	+0.04514	+0.003900	+0.2504
(2447440.5)				5.360559	3.0752	2.7751	0.5881
A OCT. 8 (OH)	Y:	+0.2166	-0.00486	+11.5881	+0.03054	+0.001454	+0.1173
				0.858630	4.3662	5.7075	2.3709
OCT. 8 (OH)	X:	+0.4956	+0.00915	+24.6889	+0.05751	+0.004123	+0.2499
(2447442.5)				6.125044	3.6851	5.7567	2.0861
A OCT.10 (OH)	Y:	+0.2060	-0.00498	+11.5303	+0.02923	+0.001200	+0.1163
				1.623805	5.1433	6.0147	3.8660
OCT.10 (OH)	X:	+0.5120	+0.00817	+24.6139	+0.05432	+0.001498	+0.2485
(2447444.5)				0.606120	4.4874	5.9720	3.5793
A OCT.12 (OH)	Y:	+0.1965	-0.00583	+11.4758	+0.03628	+0.002287	+0.1160
				2.389151	5.9897	2.7173	5.3632
OCT.12 (OH)	X:	+0.5294	+0.00644	+24.5387	+0.06259	+0.004233	+0.2485
(2447446.5)				1.370605	5.4376	2.8502	5.0764
A OCT.14 (OH)	Y:	+0.1855	-0.00513	+11.4181	+0.03191	+0.000667	+0.1152
				3.154086	0.5148	6.0293	0.5755

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DU SATELLITE 1 DE SATURNE: MIMAS N=6.667

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
OCT.14 (0H)	X:	+0.5434	+0.00763	+24.4662	+0.05408	+0.002178	+0.2474
(2447448.5)				2.134634	6.1473	6.0112	0.2878
A OCT.16 (0H)	Y:	+0.1746	-0.00506	+11.3611	+0.03236	+0.000900	+0.1150
				3.919040	1.3556	0.0071	2.0722
OCT.16 (0H)	X:	+0.5577	+0.00700	+24.3945	+0.05609	+0.000903	+0.2472
(2447450.5)				2.898709	0.6505	0.8496	1.7849
A OCT.18 (0H)	Y:	+0.1643	-0.00555	+11.3059	+0.03217	+0.001206	+0.1143
				4.683689	2.0433	3.0763	3.5692
OCT.18 (0H)	X:	+0.5715	+0.00632	+24.3251	+0.05904	+0.001465	+0.2464
(2447452.5)				3.662719	1.4206	3.3725	3.2810
A OCT.20 (0H)	Y:	+0.1533	-0.00519	+11.2509	+0.03464	+0.000836	+0.1138
				5.448346	2.8707	5.4447	5.0668
OCT.20 (0H)	X:	+0.5838	+0.00661	+24.2560	+0.06221	+0.002123	+0.2455
(2447454.5)				4.426685	2.2786	5.6292	4.7785
A OCT.22 (0H)	Y:	+0.1431	-0.00553	+11.1943	+0.03228	+0.000730	+0.1132
				6.212798	3.7350	2.3596	0.2799
OCT.22 (0H)	X:	+0.5977	+0.00500	+24.1865	+0.05015	+0.003292	+0.2449
(2447456.5)				5.190268	3.0822	2.6477	6.2733
A OCT.24 (0H)	Y:	+0.1324	-0.00541	+11.1403	+0.03249	+0.000291	+0.1125
				0.693917	4.5052	3.0440	1.7782
OCT.24 (0H)	X:	+0.6088	+0.00554	+24.1231	+0.05478	+0.000542	+0.2437
(2447458.5)				5.954032	3.8181	4.8165	1.4875
A OCT.26 (0H)	Y:	+0.1209	-0.00482	+11.0870	+0.02886	+0.002169	+0.1119
				1.457812	5.1401	5.8857	3.2716
OCT.26 (0H)	X:	+0.6181	+0.00623	+24.0659	+0.05490	+0.004697	+0.2433
(2447460.5)				0.434367	4.3927	5.8861	2.9797
A OCT.28 (0H)	Y:	+0.1110	-0.00564	+11.0355	+0.03454	+0.001369	+0.1113
				2.222054	6.0005	2.5881	4.7699
OCT.28 (0H)	X:	+0.6301	+0.00394	+24.0017	+0.06149	+0.003464	+0.2424
(2447462.5)				1.198155	5.3980	2.7547	4.4773
A OCT.30 (0H)	Y:	+0.1006	-0.00555	+10.9851	+0.03498	+0.001168	+0.1108
				2.985955	0.4496	2.7878	6.2617
OCT.30 (0H)	X:	+0.6398	+0.00416	+23.9442	+0.06121	+0.001153	+0.2421
(2447464.5)				1.961720	6.1258	3.0176	5.9694
A OCT.32 (0H)	Y:	+0.0893	-0.00482	+10.9317	+0.03322	+0.001678	+0.1104
				3.749864	1.3874	6.0419	1.4765
NOV. 1 (0H)	X:	+0.6478	+0.00481	+23.8839	+0.05484	+0.002764	+0.2416
(2447466.5)				2.725103	0.6858	6.1847	1.1838
A NOV. 3 (0H)	Y:	+0.0791	-0.00533	+10.8821	+0.03302	+0.000696	+0.1099
				4.513512	2.0696	2.8143	2.9701
NOV. 3 (0H)	X:	+0.6567	+0.00349	+23.8296	+0.05872	+0.001879	+0.2412
(2447468.5)				3.488535	1.3720	2.8463	2.6786
A NOV. 5 (0H)	Y:	+0.0686	-0.00524	+10.8325	+0.03363	+0.000554	+0.1095
				5.277084	2.8549	4.0678	4.4675
NOV. 5 (0H)	X:	+0.6636	+0.00378	+23.7744	+0.06265	+0.001699	+0.2406
(2447470.5)				4.251968	2.2228	5.1739	4.1751
A NOV. 7 (0H)	Y:	+0.0581	-0.00509	+10.7835	+0.03441	+0.000513	+0.1090
				6.040558	3.6638	6.2030	5.9634
NOV. 7 (0H)	X:	+0.6711	+0.00299	+23.7210	+0.05777	+0.000440	+0.2402
(2447472.5)				5.015153	3.0237	2.1563	5.6716
A NOV. 9 (0H)	Y:	+0.0483	-0.00539	+10.7342	+0.03404	+0.001158	+0.1083
				0.520775	4.5469	2.5490	1.1763

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 1 DE SATURNE: MIMAS N=6.667

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
NOV. 9 (OH)	X:	+0.6784	+0.00211	+23.6672	+0.05358	+0.002914	+0.2389
(2447474.5)				5.778312	3.9092	2.7471	0.8829
A NOV.11 (OH)	Y:	+0.0373	-0.00470	+10.6881	+0.03050	+0.001507	+0.1080
				1.283740	5.1915	5.8133	2.6718
NOV.11 (OH)	X:	+0.6820	+0.00355	+23.6261	+0.05487	+0.004444	+0.2389
(2447476.5)				0.258236	4.4147	5.8200	2.3786
A NOV.13 (OH)	Y:	+0.0272	-0.00489	+10.6419	+0.03082	+0.000534	+0.1071
				2.046833	6.0108	0.0073	4.1666
NOV.13 (OH)	X:	+0.6875	+0.00223	+23.5788	+0.05494	+0.000351	+0.2376
(2447478.5)				1.021371	5.2993	0.4537	3.8723
A NOV.15 (OH)	Y:	+0.0180	-0.00548	+10.6003	+0.03591	+0.002263	+0.1069
				2.809927	0.4097	2.7401	5.6602
NOV.15 (OH)	X:	+0.6934	+0.00085	+23.5363	+0.06562	+0.004203	+0.2380
(2447480.5)				1.784721	6.0904	2.8349	5.3669
A NOV.17 (OH)	Y:	+0.0075	-0.00464	+10.5550	+0.03309	+0.000971	+0.1062
				3.572844	1.3223	5.9018	0.8723
NOV.17 (OH)	X:	+0.6958	+0.00216	+23.4924	+0.05531	+0.002527	+0.2371
(2447482.5)				2.547666	0.6473	5.9853	0.5787
A NOV.19 (OH)	Y:	-0.0024	-0.00463	+10.5124	+0.03435	+0.000716	+0.1061
				4.335767	2.1102	6.1356	2.3657
NOV.19 (OH)	X:	+0.6991	+0.00135	+23.4522	+0.05746	+0.000453	+0.2373
(2447484.5)				3.310751	1.3954	1.1059	2.0739
A NOV.21 (OH)	Y:	-0.0117	-0.00501	+10.4711	+0.03185	+0.001077	+0.1056
				5.098390	2.8407	3.1558	3.8618
NOV.21 (OH)	X:	+0.7016	+0.00075	+23.4147	+0.05858	+0.001457	+0.2368
(2447486.5)				4.073792	2.1409	3.6140	3.5698
A NOV.23 (OH)	Y:	-0.0216	-0.00459	+10.4311	+0.03424	+0.000803	+0.1053
				5.861082	3.6164	5.7081	5.3571
NOV.23 (OH)	X:	+0.7030	+0.00096	+23.3783	+0.06190	+0.001870	+0.2364
(2447488.5)				4.836835	2.9543	5.7020	5.0666
A NOV.25 (OH)	Y:	-0.0306	-0.00484	+10.3906	+0.03406	+0.000773	+0.1049
				0.340505	4.4932	2.1440	0.5688
NOV.25 (OH)	X:	+0.7057	-0.00045	+23.3400	+0.05422	+0.003055	+0.2359
(2447490.5)				5.599659	3.8785	2.5832	0.2774
A NOV.27 (OH)	Y:	-0.0401	-0.00457	+10.3530	+0.03288	+0.000009	+0.1044
				1.102903	5.2435	3.0459	2.0657
NOV.27 (OH)	X:	+0.7054	+0.00029	+23.3113	+0.05506	+0.001202	+0.2353
(2447492.5)				0.079423	4.5265	5.6275	1.7749
A NOV.29 (OH)	Y:	-0.0500	-0.00411	+10.3155	+0.02817	+0.001693	+0.1039
				1.865059	6.0201	5.9119	3.5577
NOV.29 (OH)	X:	+0.7042	+0.00062	+23.2848	+0.04840	+0.003823	+0.2348
(2447494.5)				0.842171	5.1982	5.9272	3.2664
A NOV.31 (OH)	Y:	-0.0582	-0.00485	+10.2825	+0.03370	+0.001728	+0.1036
				2.627524	0.4286	2.6647	5.0545
DEC. 1 (OH)	X:	+0.7056	-0.00158	+23.2571	+0.06248	+0.004223	+0.2346
(2447496.5)				1.605376	6.0608	2.7536	4.7639
A DEC. 3 (OH)	Y:	-0.0671	-0.00455	+10.2492	+0.03211	+0.000757	+0.1031
				3.389706	1.2042	2.9324	0.2621
DEC. 3 (OH)	X:	+0.7041	-0.00098	+23.2333	+0.05749	+0.000560	+0.2343
(2447498.5)				2.368270	0.5402	3.3393	6.2556
A DEC. 5 (OH)	Y:	-0.0765	-0.00388	+10.2152	+0.03437	+0.001727	+0.1030
				4.152097	2.1219	5.9675	1.7583

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 1 DE SATURNE: MIMAS N=6.667

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
DEC. 5 (OH)	X:	+0.7014	-0.00048	+23.2068	+0.05580	+0.002660	+0.2345
(2447500.5)				3.131183	1.4361	6.1043	1.4697
A DEC. 7 (OH)	Y:	-0.0848	-0.00441	+10.1844	+0.03129	+0.000742	+0.1026
				4.914146	2.8329	2.9334	3.2510
DEC. 7 (OH)	X:	+0.6997	-0.00182	+23.1879	+0.05460	+0.001958	+0.2343
(2447502.5)				3.894107	2.0921	3.0270	2.9642
A DEC. 9 (OH)	Y:	-0.0933	-0.00422	+10.1544	+0.03180	+0.000374	+0.1025
				5.676244	3.6146	4.3479	4.7471
DEC. 9 (OH)	X:	+0.6962	-0.00148	+23.1687	+0.05926	+0.001739	+0.2340
(2447504.5)				4.657118	2.8976	5.2814	4.4610
A DEC.11 (OH)	Y:	-0.1017	-0.00406	+10.1256	+0.03267	+0.000559	+0.1022
				0.155142	4.4068	0.3470	6.2417
DEC.11 (OH)	X:	+0.6934	-0.00227	+23.1497	+0.05550	+0.000781	+0.2340
(2447506.5)				5.419968	3.7608	1.9876	5.9569
A DEC.13 (OH)	Y:	-0.1096	-0.00424	+10.0977	+0.03365	+0.001001	+0.1017
				0.917218	5.2541	2.4553	1.4544
DEC.13 (OH)	X:	+0.6899	-0.00283	+23.1329	+0.05557	+0.002148	+0.2332
(2447508.5)				6.182908	4.6208	2.6857	1.1696
A DEC.15 (OH)	Y:	-0.1184	-0.00360	+10.0717	+0.02803	+0.001389	+0.1016
				1.678915	6.0206	5.8129	2.9481
DEC.15 (OH)	X:	+0.6833	-0.00153	+23.1264	+0.04595	+0.004396	+0.2334
(2447510.5)				0.662491	5.1861	5.8519	2.6640
A DEC.17 (OH)	Y:	-0.1261	-0.00389	+10.0478	+0.02976	+0.000160	+0.1010
				2.440895	0.5082	1.7229	4.4437
DEC.17 (OH)	X:	+0.6789	-0.00310	+23.1153	+0.05257	+0.001074	+0.2325
(2447512.5)				1.425562	6.0535	2.5002	4.1598
A DEC.19 (OH)	Y:	-0.1332	-0.00429	+10.0280	+0.03035	+0.002057	+0.1010
				3.202771	1.1263	2.7990	5.9352
DEC.19 (OH)	X:	+0.6744	-0.00406	+23.1113	+0.05846	+0.003915	+0.2332
(2447514.5)				2.188743	0.4450	2.8606	5.6530
A DEC.21 (OH)	Y:	-0.1416	-0.00342	+10.0052	+0.03164	+0.001357	+0.1006
				3.964793	2.0890	5.8357	1.1480
DEC.21 (OH)	X:	+0.6667	-0.00268	+23.1021	+0.05298	+0.003057	+0.2327
(2447516.5)				2.951700	1.4169	5.9345	0.8666
A DEC.23 (OH)	Y:	-0.1491	-0.00353	+ 9.9862	+0.03164	+0.000587	+0.1006
				4.726762	2.8343	6.0448	2.6397
DEC.23 (OH)	X:	+0.6601	-0.00368	+23.0994	+0.05277	+0.000266	+0.2332
(2447518.5)				3.714816	2.1169	2.2508	2.3611
A DEC.25 (OH)	Y:	-0.1561	-0.00385	+ 9.9676	+0.02863	+0.000970	+0.1004
				5.488552	3.6440	3.1123	4.1362
DEC.25 (OH)	X:	+0.6528	-0.00417	+23.0988	+0.05190	+0.001358	+0.2331
(2447520.5)				4.477924	2.8675	3.7671	3.8583
A DEC.27 (OH)	Y:	-0.1636	-0.00341	+ 9.9515	+0.03011	+0.000803	+0.1004
				6.250496	4.3696	6.0155	5.6306
DEC.27 (OH)	X:	+0.6444	-0.00397	+23.0994	+0.05478	+0.001699	+0.2332
(2447522.5)				5.241104	3.6554	5.8971	5.3553
A DEC.29 (OH)	Y:	-0.1703	-0.00362	+ 9.9357	+0.03149	+0.000852	+0.1001
				0.729299	5.2272	2.0696	0.8428
DEC.29 (OH)	X:	+0.6372	-0.00522	+23.0979	+0.05405	+0.002901	+0.2329
(2447524.5)				6.004233	4.6219	2.5089	0.5673
A DEC.31 (OH)	Y:	-0.1775	-0.00331	+ 9.9222	+0.02902	+0.000100	+0.1000
				1.491098	6.0155	5.4628	2.3390

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 1 DE SATURNE: MIMAS N=6.667

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
DEC.30 (OH) (2447525.5)	X:	+0.6326	-0.00506	+23.1010 0.102665	+0.05379 4.9778	+0.001834 2.6598	+0.2327 1.3167
A DEC.32 (OH)	Y:	-0.1813	-0.00299	+ 9.9154 1.871928	+0.02630 0.1825	+0.001316 5.7790	+0.0999 3.0848
DEC.32 (OH) (2447527.5)	X:	+0.6214	-0.00385	+23.1121 0.865677	+0.04087 5.6353	+0.004291 5.8570	+0.2330 2.8111
A DEC.34 (OH)	Y:	-0.1878	-0.00333	+ 9.9050 2.633927	+0.02781 0.9074	+0.000327 2.4990	+0.0996 4.5813

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 2 DE SATURNE: ENCELADE N=4.586

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
JAN. 1 (0H) (2447161.5)	X:	+0.0250	-0.00085	+29.7788 6.034456	+0.07624 4.5972	+0.000359 0.3539	+0.0651 5.8391
A JAN.17 (0H)	Y:	-0.0933	+0.00004	+13.6697 1.479606	+0.02958 0.0313	+0.000115 2.2425	+0.0299 1.2883
JAN.17 (0H) (2447177.5).	X:	+0.0108	-0.00065	+30.0402 3.973694	+0.07204 2.7011	+0.000400 4.6813	+0.0659 1.6591
A FEV. 2 (0H)	Y:	-0.0932	+0.00000	+13.7563 5.707917	+0.02758 4.4218	+0.000139 0.2612	+0.0301 3.3961
FEV. 1 (0H) (2447192.5)	X:	-0.0004	-0.00079	+30.4406 3.616665	+0.06875 2.5226	+0.000425 4.5393	+0.0669 0.8869
A FEV.17 (0H)	Y:	-0.0937	+0.00004	+13.8986 5.355914	+0.02551 4.2516	+0.000152 6.1364	+0.0305 2.6289
FEV.17 (0H) (2447208.5)	X:	-0.0146	-0.00092	+31.0237 1.565740	+0.06504 0.6809	+0.000457 2.6419	+0.0682 3.0020
A MAR. 4 (0H)	Y:	-0.0928	-0.00004	+14.1134 3.309828	+0.02421 2.4417	+0.000164 4.2236	+0.0310 4.7491
MAR. 1 (0H) (2447221.5)	X:	-0.0275	-0.00101	+31.6013 4.616441	+0.06139 3.9316	+0.000421 5.7490	+0.0696 2.7637
A MAR.17 (0H)	Y:	-0.0928	-0.00001	+14.3357 0.080827	+0.02376 5.6842	+0.000205 1.1249	+0.0315 4.5125
MAR.17 (0H) (2447237.5)	X:	-0.0432	-0.00137	+32.4104 2.578062	+0.05904 2.1495	+0.000433 3.9821	+0.0715 4.8928
A AVR. 2 (0H)	Y:	-0.0926	+0.00009	+14.6590 4.328572	+0.02381 3.9209	+0.000199 5.5253	+0.0322 0.3607
AVR. 1 (0H) (2447252.5)	X:	-0.0622	-0.00146	+33.2334 2.244866	+0.05665 2.0601	+0.000466 3.8541	+0.0732 4.1470
A AVR.17 (0H)	Y:	-0.0911	+0.00011	+15.0024 3.996891	+0.02460 3.8316	+0.000185 5.5047	+0.0330 5.8976
AVR.17 (0H) (2447268.5)	X:	-0.0846	-0.00149	+34.1186 0.221254	+0.05445 0.3202	+0.000470 2.1878	+0.0752 0.0062
A MAI 3 (0H)	Y:	-0.0895	+0.00029	+15.3933 1.973560	+0.02501 2.0354	+0.000184 3.8690	+0.0339 1.7568
MAI 1 (0H) (2447282.5)	X:	-0.1064	-0.00145	+34.8407 1.598076	+0.05221 1.9327	+0.000545 3.9011	+0.0766 2.6697
A MAI 17 (0H)	Y:	-0.0855	+0.00029	+15.7312 3.349197	+0.02462 3.6179	+0.000167 5.7511	+0.0347 4.4194
MAI 17 (0H) (2447298.5)	X:	-0.1294	-0.00160	+35.5387 5.869659	+0.04765 0.2384	+0.000560 2.2764	+0.0780 4.8218
A JUN. 2 (0H)	Y:	-0.0804	+0.00046	+16.0792 1.335278	+0.02255 1.8200	+0.000215 4.2153	+0.0354 0.2840
JUN. 1 (0H) (2447313.5)	X:	-0.1524	-0.00142	+35.9959 5.558148	+0.04258 0.2577	+0.000621 2.3626	+0.0788 4.0892
A JUN.17 (0H)	Y:	-0.0732	+0.00053	+16.3332 1.020634	+0.01859 1.7570	+0.000247 4.2174	+0.0359 5.8325
JUN.17 (0H) (2447329.5)	X:	-0.1743	-0.00118	+36.2195 3.551764	+0.03625 4.9820	+0.000667 0.7197	+0.0793 6.2388
A JUL. 3 (0H)	Y:	-0.0649	+0.00072	+16.4912 5.293448	+0.01353 0.1572	+0.000288 2.5146	+0.0362 1.6943

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 2 DE SATURNE: ENCELADE N=4.586

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
JUL. 1 (OH)	X:	-0.1921	-0.00077	+36.1702	+0.03358	+0.000678	+0.0791
(2447343.5)				4.936630	0.6030	2.4458	2.6173
A JUL.17 (OH)	Y:	-0.0549	+0.00067	+16.5168	+0.00975	+0.000295	+0.0362
				0.391696	2.1880	4.0079	4.3559
JUL.17 (OH)	X:	-0.2045	-0.00069	+35.8355	+0.03551	+0.000690	+0.0784
(2447359.5)				2.925369	5.4943	0.7039	4.7591
A AOU. 2 (OH)	Y:	-0.0435	+0.00071	+16.4156	+0.01165	+0.000278	+0.0360
				4.659809	1.1111	2.2289	0.2089
AOU. 1 (OH)	X:	-0.2141	-0.00033	+35.2956	+0.04339	+0.000619	+0.0773
(2447374.5)				2.605047	5.6603	0.6215	4.0094
A AOU.17 (OH)	Y:	-0.0323	+0.00064	+16.2072	+0.01691	+0.000263	+0.0356
				4.336543	1.2701	2.0771	5.7409
AOU.17 (OH)	X:	-0.2180	-0.00017	+34.5416	+0.05433	+0.000545	+0.0757
(2447390.5)				0.580365	3.9888	5.1239	6.1333
A SEP. 2 (OH)	Y:	-0.0219	+0.00072	+15.8955	+0.02320	+0.000211	+0.0349
				2.309802	5.8180	0.2735	1.5801
SEP. 1 (OH)	X:	-0.2187	-0.00006	+33.7383	+0.06433	+0.000432	+0.0741
(2447405.5)				0.245434	3.8996	4.9960	5.3677
A SEP.17 (OH)	Y:	-0.0116	+0.00061	+15.5503	+0.02786	+0.000190	+0.0342
				1.973961	5.6569	0.1649	0.8148
SEP.17 (OH)	X:	-0.2190	+0.00030	+32.8525	+0.07303	+0.000364	+0.0724
(2447421.5)				4.487651	2.0520	3.2405	1.1933
A OCT. 3 (OH)	Y:	-0.0026	+0.00059	+15.1594	+0.03174	+0.000145	+0.0334
				6.216688	3.7760	4.6162	2.9236
OCT. 1 (OH)	X:	-0.2156	+0.00025	+32.1020	+0.07782	+0.000290	+0.0710
(2447435.5)				5.837017	3.5528	4.5860	3.8177
A OCT.17 (OH)	Y:	+0.0059	+0.00040	+14.8236	+0.03450	+0.000126	+0.0328
				1.284366	5.2265	0.2149	5.5494
OCT.17 (OH)	X:	-0.2099	+0.00014	+31.3267	+0.08232	+0.000216	+0.0695
(2447451.5)				3.782533	1.6445	2.8440	5.9139
A NOV. 2 (OH)	Y:	+0.0124	+0.00047	+14.4606	+0.03595	+0.000102	+0.0321
				5.515970	3.2937	4.7505	1.3670
NOV. 1 (OH)	X:	-0.2055	+0.00011	+30.7103	+0.08396	+0.000220	+0.0684
(2447466.5)				3.422282	1.4014	2.7248	5.1280
A NOV.17 (OH)	Y:	+0.0191	+0.00037	+14.1571	+0.03672	+0.000085	+0.0315
				5.159610	3.0397	5.0057	0.5836
NOV.17 (OH)	X:	-0.2028	+0.00033	+30.1946	+0.08448	+0.000195	+0.0675
(2447482.5)				1.358847	5.7480	1.0702	0.9357
A DEC. 3 (OH)	Y:	+0.0244	+0.00041	+13.8814	+0.03629	+0.000096	+0.0310
				3.101063	1.0768	3.3439	2.6797
DEC. 1 (OH)	X:	-0.1991	+0.00024	+29.8805	+0.08429	+0.000277	+0.0670
(2447496.5)				2.693140	0.8978	2.8055	3.5504
A DEC.17 (OH)	Y:	+0.0304	+0.00025	+13.6834	+0.03493	+0.000076	+0.0307
				4.440201	2.5156	5.0475	5.3005
DEC.17 (OH)	X:	-0.1939	+0.00004	+29.6803	+0.08175	+0.000307	+0.0669
(2447512.5)				0.626874	5.2433	0.9259	5.6429
A DEC.33 (OH)	Y:	+0.0348	+0.00036	+13.5160	+0.03299	+0.000103	+0.0304
				2.380049	0.5546	3.1282	1.1166

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 3 DE SATURNE: TETHYS N=3.328

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
JAN. 1 (OH)	X:	+0.0000	+0.00000	+36.8643	+0.06764	+0.000426	+0.0030
(2447161.5)				0.621020	5.5279	1.1143	4.3150
A JAN.17 (OH)	Y:	-0.0013	+0.00000	+17.5366	+0.02243	+0.000176	+0.0014
				2.340442	0.9974	2.9082	6.0423
JAN.17 (OH)	X:	+0.0000	+0.00000	+37.1830	+0.06500	+0.000469	+0.0030
(2447177.5)				3.576382	2.4304	4.2532	3.9311
A FEV. 2 (OH)	Y:	-0.0013	+0.00000	+17.6587	+0.02123	+0.000201	+0.0015
				5.304548	4.2340	6.0080	5.6757
FEV. 1 (OH)	X:	+0.0000	+0.00000	+37.6760	+0.06312	+0.000509	+0.0032
(2447192.5)				3.209082	2.3026	4.0395	3.1975
A FEV.17 (OH)	Y:	-0.0013	+0.00000	+17.8476	+0.02088	+0.000222	+0.0015
				4.945058	4.1735	5.7503	4.9548
FEV.17 (OH)	X:	-0.0001	+0.00000	+38.3926	+0.06262	+0.000556	+0.0033
(2447208.5)				6.173410	5.5470	0.9122	2.8733
A MAR. 4 (OH)	Y:	-0.0014	+0.00000	+18.1274	+0.02204	+0.000239	+0.0015
				1.633805	1.2027	2.5635	4.6122
MAR. 1 (OH)	X:	-0.0001	+0.00000	+39.1029	+0.06346	+0.000588	+0.0034
(2447221.5)				5.444959	5.0572	0.3430	1.4100
A MAR.17 (OH)	Y:	-0.0014	+0.00000	+18.4121	+0.02419	+0.000248	+0.0016
				0.910767	0.7370	1.9524	3.1598
MAR.17 (OH)	X:	+0.0000	+0.00000	+40.1002	+0.06639	+0.000626	+0.0036
(2447237.5)				2.138203	2.0476	3.5606	1.1017
A AVR. 2 (OH)	Y:	-0.0015	+0.00000	+18.8250	+0.02804	+0.000250	+0.0017
				3.892658	3.9907	5.1363	2.8491
AVR. 1 (OH)	X:	+0.0000	+0.00000	+41.1121	+0.07030	+0.000655	+0.0038
(2447252.5)				1.793919	1.9733	3.4635	0.4264
A AVR.17 (OH)	Y:	-0.0016	+0.00000	+19.2616	+0.03198	+0.000245	+0.0018
				3.552076	3.8598	5.0514	2.1726
AVR.17 (OH)	X:	-0.0001	+0.00000	+42.2026	+0.07516	+0.000678	+0.0040
(2447268.5)				4.785140	5.2423	0.4993	0.0866
A MAI 3 (OH)	Y:	-0.0017	+0.00000	+19.7543	+0.03571	+0.000241	+0.0019
				0.262418	0.7664	2.1600	1.8750
MAI 1 (OH)	X:	-0.0001	+0.00000	+43.0953	+0.07864	+0.000704	+0.0041
(2447282.5)				1.125233	1.8147	3.4242	5.3798
A MAI 17 (OH)	Y:	-0.0017	+0.00000	+20.1786	+0.03772	+0.000258	+0.0019
				2.886292	3.5532	5.1874	0.8455
MAI 17 (OH)	X:	-0.0001	+0.00000	+43.9551	+0.08110	+0.000735	+0.0044
(2447298.5)				4.128990	5.0843	0.5410	5.0911
A JUN. 2 (OH)	Y:	-0.0018	+0.00000	+20.6123	+0.03811	+0.000301	+0.0020
				5.889280	0.4729	2.3592	0.5815
JUN. 1 (OH)	X:	-0.0001	+0.00000	+44.5209	+0.08079	+0.000777	+0.0045
(2447313.5)				3.807398	5.0163	0.5728	4.4721
A JUN.17 (OH)	Y:	-0.0019	+0.00000	+20.9243	+0.03646	+0.000352	+0.0020
				5.565830	0.3679	2.3656	6.2188
JUN.17 (OH)	X:	-0.0001	+0.00000	+44.7971	+0.07796	+0.000821	+0.0043
(2447329.5)				0.534091	2.0344	3.9521	4.1805
A JUL. 3 (OH)	Y:	-0.0019	+0.00000	+21.1127	+0.03333	+0.000389	+0.0021
				2.289814	3.6677	5.6711	5.9293

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 3 DE SATURNE: TETHYS N=3.328

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
JUL. 1 (OH)	X:	-0.0001	+0.00000	+44.7319	+0.07390	+0.000841	+0.0043
(2447343.5)				3.167141	4.9469	0.5827	3.2000
A JUL.17 (OH)	Y:	-0.0019	+0.00000	+21.1327	+0.03058	+0.000399	+0.0020
				4.920319	0.3292	2.2433	4.9258
JUL.17 (OH)	X:	-0.0001	+0.00000	+44.3174	+0.06937	+0.000831	+0.0042
(2447359.5)				6.173165	2.0250	3.8894	2.8822
A AOU. 2 (OH)	Y:	-0.0019	+0.00000	+20.9872	+0.02881	+0.000377	+0.0020
				1.640587	3.7470	5.5000	4.6496
AOU. 1 (OH)	X:	+0.0000	+0.00000	+43.6458	+0.06677	+0.000791	+0.0041
(2447374.5)				5.844584	2.0496	3.8065	2.2241
A AOU.17 (OH)	Y:	-0.0018	+0.00000	+20.7054	+0.02902	+0.000342	+0.0020
				1.310352	3.7998	5.4031	3.9996
AOU.17 (OH)	X:	-0.0001	+0.00000	+42.7104	+0.06677	+0.000710	+0.0038
(2447390.5)				2.554897	5.4169	0.7722	1.9260
A SEP. 2 (OH)	Y:	-0.0017	+0.00001	+20.2874	+0.03059	+0.000291	+0.0018
				4.303246	0.8673	2.3792	3.6625
SEP. 1 (OH)	X:	-0.0001	+0.00000	+41.7151	+0.06884	+0.000630	+0.0037
(2447405.5)				2.212307	5.3881	0.6547	1.2280
A SEP.17 (OH)	Y:	-0.0016	+0.00001	+19.8261	+0.03233	+0.000248	+0.0018
				3.961385	0.7974	2.2821	2.9726
SEP.17 (OH)	X:	+0.0000	+0.00000	+40.6178	+0.07203	+0.000533	+0.0035
(2447421.5)				5.189949	2.3722	3.8868	0.9041
A OCT. 3 (OH)	Y:	-0.0016	+0.00001	+19.3024	+0.03386	+0.000201	+0.0016
				0.658064	4.0168	5.5371	2.6706
OCT. 1 (OH)	X:	-0.0001	+0.00000	+39.6919	+0.07461	+0.000468	+0.0034
(2447435.5)				1.505851	5.1853	0.4267	6.0867
A OCT.17 (OH)	Y:	-0.0015	+0.00001	+18.8467	+0.03468	+0.000171	+0.0016
				3.260291	0.5090	2.1069	1.5634
OCT.17 (OH)	X:	+0.0000	+0.00000	+38.7301	+0.07667	+0.000400	+0.0032
(2447451.5)				4.469876	2.0816	3.6756	5.7418
A NOV. 2 (OH)	Y:	-0.0014	+0.00000	+18.3531	+0.03489	+0.000140	+0.0015
				6.229145	3.6489	5.4032	1.1994
NOV. 1 (OH)	X:	+0.0000	+0.00000	+37.9639	+0.07746	+0.000368	+0.0030
(2447466.5)				4.101988	1.8931	3.5768	4.9900
A NOV.17 (OH)	Y:	-0.0013	+0.00000	+17.9341	+0.03440	+0.000126	+0.0015
				5.866843	3.4250	5.3782	0.4665
NOV.17 (OH)	X:	+0.0000	+0.00000	+37.3219	+0.07695	+0.000351	+0.0030
(2447482.5)				0.773395	5.0283	0.5311	4.6118
A DEC. 3 (OH)	Y:	-0.0013	+0.00000	+17.5455	+0.03306	+0.000122	+0.0014
				2.545123	0.2373	2.4206	0.1149
DEC. 1 (OH)	X:	+0.0000	+0.00000	+36.9259	+0.07562	+0.000357	+0.0030
(2447496.5)				3.356478	1.4827	3.3414	3.4809
A DEC.17 (OH)	Y:	-0.0012	+0.00000	+17.2616	+0.03130	+0.000132	+0.0014
				5.134807	2.9372	5.2824	5.2775
DEC.17 (OH)	X:	+0.0000	+0.00000	+36.6746	+0.07313	+0.000373	+0.0029
(2447512.5)				0.024293	4.6159	0.2354	3.1232
A DEC.33 (OH)	Y:	-0.0012	+0.00000	+17.0062	+0.02847	+0.000148	+0.0014
				1.810596	6.0255	2.1734	4.9028

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 4 DE SATURNE: DIONE N=2.296

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
JAN. 1 (OH)	X:	-0.1525	-0.00004	+47.2125	+0.11527	+0.000467	+0.0525
(2447161.5)				2.981195	1.5598	3.4260	4.5238
A JAN.17 (OH)	Y:	-0.0090	-0.00002	+21.6690	+0.04453	+0.000186	+0.0241
				4.708862	3.2599	5.2275	6.2560
JAN.17 (OH)	X:	-0.1533	-0.00011	+47.6274	+0.11179	+0.000514	+0.0531
(2447177.5)				1.980878	0.7272	2.6407	2.5354
A FEV. 2 (OH)	Y:	-0.0095	+0.00000	+21.8077	+0.04256	+0.000219	+0.0243
				3.714410	2.4286	4.3803	4.2714
FEV. 1 (OH)	X:	-0.1551	-0.00017	+48.2660	+0.10771	+0.000584	+0.0538
(2447192.5)				4.973411	3.8858	5.7751	2.2451
A FEV.17 (OH)	Y:	-0.0099	+0.00000	+22.0338	+0.04058	+0.000250	+0.0246
				0.428872	5.6028	1.1938	3.9868
FEV.17 (OH)	X:	-0.1578	-0.00025	+49.1907	+0.10330	+0.000637	+0.0551
(2447208.5)				3.981453	3.0954	4.9886	0.2667
A MAR. 4 (OH)	Y:	-0.0099	+0.00001	+22.3755	+0.03892	+0.000274	+0.0250
				5.724932	4.8368	0.3198	2.0118
MAR. 1 (OH)	X:	-0.1610	-0.00026	+50.1057	+0.09968	+0.000684	+0.0561
(2447221.5)				2.394575	1.6860	3.5729	3.3747
A MAR.17 (OH)	Y:	-0.0097	+0.00003	+22.7269	+0.03824	+0.000284	+0.0254
				4.141291	3.4537	5.1414	5.1238
MAR.17 (OH)	X:	-0.1653	-0.00033	+51.3900	+0.09536	+0.000742	+0.0577
(2447237.5)				1.414432	0.9471	2.8419	1.4081
A AVR. 2 (OH)	Y:	-0.0093	+0.00007	+23.2409	+0.03836	+0.000293	+0.0260
				3.164108	2.7327	4.3665	3.1588
AVR. 1 (OH)	X:	-0.1703	-0.00033	+52.6925	+0.09108	+0.000798	+0.0591
(2447252.5)				4.429412	4.2069	6.0841	1.1405
A AVR.17 (OH)	Y:	-0.0083	+0.00011	+23.7878	+0.03892	+0.000291	+0.0267
				6.180649	5.9860	1.3395	2.8944
AVR.17 (OH)	X:	-0.1758	-0.00033	+54.0949	+0.08683	+0.000832	+0.0608
(2447268.5)				3.464102	3.5323	5.4421	5.4724
A MAI 3 (OH)	Y:	-0.0068	+0.00014	+24.4076	+0.03945	+0.000287	+0.0274
				5.215610	5.2637	0.7697	0.9402
MAI 1 (OH)	X:	-0.1808	-0.00028	+55.2427	+0.08261	+0.000874	+0.0620
(2447282.5)				4.196368	4.5342	0.1800	0.6261
A MAI 17 (OH)	Y:	-0.0049	+0.00018	+24.9442	+0.03875	+0.000305	+0.0281
				5.946906	6.1994	1.8999	2.3786
MAI 17 (OH)	X:	-0.1857	-0.00021	+56.3476	+0.07737	+0.000910	+0.0635
(2447298.5)				3.244036	3.9231	5.8978	4.9691
A JUN. 2 (OH)	Y:	-0.0021	+0.00021	+25.4963	+0.03593	+0.000355	+0.0287
				4.992240	5.4925	1.4062	0.4327
JUN. 1 (OH)	X:	-0.1889	-0.00014	+57.0748	+0.07159	+0.000961	+0.0641
(2447313.5)				6.282534	1.0284	2.9927	4.7236
A JUN.17 (OH)	Y:	+0.0009	+0.00021	+25.8984	+0.03103	+0.000414	+0.0293
				1.744411	2.5207	4.7736	0.1844
JUN.17 (OH)	X:	-0.1911	+0.00000	+57.4310	+0.06605	+0.000995	+0.0649
(2447329.5)				5.337089	0.5158	2.4229	2.7858
A JUL. 3 (OH)	Y:	+0.0045	+0.00022	+26.1497	+0.02478	+0.000456	+0.0295
				0.795010	1.9912	4.1328	4.5272

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 4 DE SATURNE: DIONE N=2.296

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
JUL. 1 (0H) (2447343.5)	X:	-0.1912	+0.00008	+57.3487 6.080405	+0.06321 1.6808	+0.001014 3.4519	+0.0646 4.2326
A JUL.17 (0H)	Y:	+0.0076	+0.00021	+26.1910 1.534728	+0.02106 3.2670	+0.000464 5.1031	+0.0296 5.9682
JUL.17 (0H) (2447359.5)	X:	-0.1895	+0.00018	+56.8186 5.131945	+0.06500 1.2362	+0.000996 2.8168	+0.0643 2.2889
A AOU. 2 (0H)	Y:	+0.0111	+0.00019	+26.0309 0.582465	+0.02240 3.0097	+0.000440 4.4199	+0.0294 4.0242
AOU. 1 (0H) (2447374.5)	X:	-0.1868	+0.00028	+55.9594 1.881806	+0.07153 4.6954	+0.000947 6.0967	+0.0632 2.0363
A AOU.17 (0H)	Y:	+0.0139	+0.00015	+25.7020 3.612626	+0.02787 0.2426	+0.000396 1.3990	+0.0291 3.7643
AOU.17 (0H) (2447390.5)	X:	-0.1824	+0.00032	+54.7625 0.921529	+0.08218 4.1100	+0.000844 5.4016	+0.0619 0.0785
A SEP. 2 (0H)	Y:	+0.0163	+0.00011	+25.2080 2.650300	+0.03491 5.9066	+0.000336 0.7107	+0.0286 1.8090
SEP. 1 (0H) (2447405.5)	X:	-0.1775	+0.00031	+53.4888 3.941058	+0.09257 1.1185	+0.000765 2.3579	+0.0605 6.0944
A SEP.17 (0H)	Y:	+0.0180	+0.00006	+24.6612 5.669072	+0.04063 2.8712	+0.000291 3.9796	+0.0280 1.5362
SEP.17 (0H) (2447421.5)	X:	-0.1727	+0.00031	+52.0850 2.965283	+0.10286 0.3838	+0.000639 1.6262	+0.0591 4.1208
A OCT. 3 (0H)	Y:	+0.0191	+0.00003	+24.0424 4.693790	+0.04542 2.0930	+0.000237 3.2616	+0.0273 5.8515
OCT. 1 (0H) (2447435.5)	X:	-0.1684	+0.00026	+50.9016 3.675935	+0.11005 1.2669	+0.000568 2.5497	+0.0577 5.5322
A OCT.17 (0H)	Y:	+0.0196	+0.00000	+23.5066 5.405979	+0.04841 2.9490	+0.000200 4.2160	+0.0267 0.9792
OCT.17 (0H) (2447451.5)	X:	-0.1643	+0.00022	+49.6724 2.686493	+0.11620 0.4556	+0.000468 1.8294	+0.0565 3.5469
A NOV. 2 (0H)	Y:	+0.0197	+0.00000	+22.9320 4.419458	+0.05056 2.1075	+0.000160 3.5334	+0.0260 5.2820
NOV. 1 (0H) (2447466.5)	X:	-0.1611	+0.00017	+48.6952 5.680658	+0.11987 3.5945	+0.000442 5.0981	+0.0554 3.2537
A NOV.17 (0H)	Y:	+0.0195	+0.00000	+22.4508 1.134180	+0.05149 5.2245	+0.000144 0.6135	+0.0255 4.9900
NOV.17 (0H) (2447482.5)	X:	-0.1583	+0.00008	+47.8757 4.681378	+0.12148 2.7461	+0.000404 4.3667	+0.0546 1.2586
A DEC. 3 (0H)	Y:	+0.0191	-0.00002	+22.0133 0.139810	+0.05119 4.3487	+0.000136 6.2320	+0.0250 3.0048
DEC. 1 (0H) (2447496.5)	X:	-0.1569	+0.00005	+47.3723 5.375385	+0.12164 3.5650	+0.000413 5.2939	+0.0540 2.6556
A DEC.17 (0H)	Y:	+0.0186	-0.00001	+21.7031 0.838714	+0.05019 5.1478	+0.000146 0.9607	+0.0247 4.4044
DEC.17 (0H) (2447512.5)	X:	-0.1559	-0.00002	+47.0537 4.371891	+0.12007 2.7089	+0.000412 4.5172	+0.0539 0.6605
A DEC.33 (0H)	Y:	+0.0181	-0.00002	+21.4375 6.124535	+0.04795 4.2669	+0.000164 0.1761	+0.0244 2.4159

1986 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 5 DE SATURNE: RHEA N=1.391

		AO	A1	BO FO	B1 F1	B2 F2	CO PO
JAN. 1 (OH)	X:	-0.1097	+0.00002	+65.9574	+0.15359	+0.000650	+0.0361
(2447161.5)				2.641799	1.2282	3.0423	3.7584
A JAN.17 (OH)	Y:	-0.0130	-0.00008	+30.3913	+0.05889	+0.000260	+0.0166
				4.359283	2.9294	4.8135	5.4788
JAN.17 (OH)	X:	-0.1095	-0.00001	+66.5379	+0.15006	+0.000727	+0.0363
(2447177.5)				6.012742	4.7700	0.3299	4.2491
A FEV. 2 (OH)	Y:	-0.0144	-0.00009	+30.5971	+0.05691	+0.000304	+0.0166
				1.453014	0.1930	2.0663	5.9747
FEV. 1 (OH)	X:	-0.1095	-0.00005	+67.4284	+0.14598	+0.000793	+0.0364
(2447192.5)				1.714776	0.6458	2.5068	1.9603
A FEV.17 (OH)	Y:	-0.0159	-0.00008	+30.9236	+0.05495	+0.000340	+0.0167
				3.443452	2.3667	4.1835	3.6924
FEV.17 (OH)	X:	-0.1107	-0.00007	+68.7210	+0.14100	+0.000883	+0.0369
(2447208.5)				5.093533	4.2264	6.0888	2.4617
A MAR. 4 (OH)	Y:	-0.0173	-0.00007	+31.4130	+0.05337	+0.000377	+0.0168
				0.543941	5.9735	1.4154	4.1965
MAR. 1 (OH)	X:	-0.1118	-0.00010	+69.9996	+0.13665	+0.000952	+0.0373
(2447221.5)				4.308802	3.6215	5.4765	0.9058
A MAR.17 (OH)	Y:	-0.0184	-0.00006	+31.9135	+0.05283	+0.000399	+0.0170
				6.045714	5.3906	0.7554	2.6440
MAR.17 (OH)	X:	-0.1136	-0.00016	+71.7931	+0.13162	+0.001056	+0.0383
(2447237.5)				1.415882	0.9717	2.8394	1.4106
A AVR. 2 (OH)	Y:	-0.0196	-0.00004	+32.6418	+0.05348	+0.000413	+0.0174
				3.155826	2.7577	4.3671	3.1522
AVR. 1 (OH)	X:	-0.1163	-0.00016	+73.6120	+0.12658	+0.001126	+0.0389
(2447252.5)				3.422989	3.2307	5.0848	5.4266
A AVR.17 (OH)	Y:	-0.0204	-0.00003	+33.4142	+0.05460	+0.000417	+0.0177
				5.164561	5.0031	0.3380	0.8855
AVR.17 (OH)	X:	-0.1190	-0.00021	+75.5706	+0.12183	+0.001212	+0.0400
(2447268.5)				0.544931	0.6466	2.5173	5.9542
A MAI 3 (OH)	Y:	-0.0211	+0.00000	+34.2874	+0.05568	+0.000422	+0.0182
				2.286807	2.3714	4.1292	1.4121
MAI 1 (OH)	X:	-0.1220	-0.00017	+77.1745	+0.11731	+0.001271	+0.0409
(2447282.5)				1.174443	1.5538	3.4216	0.9185
A MAI 17 (OH)	Y:	-0.0214	+0.00002	+35.0412	+0.05517	+0.000451	+0.0186
				2.915386	3.2108	5.1432	2.6579
MAI 17 (OH)	X:	-0.1252	-0.00018	+78.7185	+0.11228	+0.001311	+0.0415
(2447298.5)				4.592904	5.3182	0.9160	1.4478
A JUN. 2 (OH)	Y:	-0.0209	+0.00003	+35.8153	+0.05192	+0.000518	+0.0189
				0.048354	0.6019	2.7042	3.1855
JUN. 1 (OH)	X:	-0.1276	-0.00010	+79.7337	+0.10742	+0.001372	+0.0421
(2447313.5)				0.341030	1.4103	3.2911	5.4968
A JUN.17 (OH)	Y:	-0.0206	+0.00008	+36.3768	+0.04629	+0.000590	+0.0193
				2.076521	2.9174	5.0624	0.9471
JUN.17 (OH)	X:	-0.1296	-0.00006	+80.2315	+0.10262	+0.001389	+0.0428
(2447329.5)				3.767045	5.2405	0.8039	6.0344
A JUL. 3 (OH)	Y:	-0.0194	+0.00007	+36.7253	+0.03929	+0.000641	+0.0196
				5.498586	0.4634	2.5134	1.4806

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 5 DE SATURNE: RHEA N=1.391

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
JUL. 1 (0H) (2447343.5)	X:	-0.1301	+0.00000	+80.1161 4.408709	+0.10012 6.2553	+0.001400 1.7458	+0.0428 1.0125
A JUL.17 (0H)	Y:	-0.0184	+0.00009	+36.7793 6.136670	+0.03516 1.5665	+0.000648 3.3831	+0.0197 2.7392
JUL.17 (0H) (2447359.5)	X:	-0.1302	+0.00011	+79.3754 1.549258	+0.10107 3.8349	+0.001378 5.5005	+0.0422 1.5627
A AOU. 2 (0H)	Y:	-0.0171	+0.00007	+36.5506 3.273421	+0.03615 5.5704	+0.000604 0.8018	+0.0195 3.2851
AOU. 1 (0H) (2447374.5)	X:	-0.1284	+0.00013	+78.1749 3.576469	+0.10595 6.2538	+0.001304 1.5026	+0.0419 5.6027
A AOU.17 (0H)	Y:	-0.0159	+0.00007	+36.0860 5.297752	+0.04144 1.7587	+0.000549 3.0812	+0.0193 1.0395
AOU.17 (0H) (2447390.5)	X:	-0.1263	+0.00021	+76.5027 0.705810	+0.11532 3.7516	+0.001195 5.1972	+0.0408 6.1308
A SEP. 2 (0H)	Y:	-0.0149	+0.00003	+35.3917 2.425090	+0.04874 5.5257	+0.000472 0.5016	+0.0189 1.5667
SEP. 1 (0H) (2447405.5)	X:	-0.1230	+0.00020	+74.7232 2.719969	+0.12531 6.0575	+0.001067 1.1529	+0.0398 3.8800
A SEP.17 (0H)	Y:	-0.0142	+0.00003	+34.6252 4.438530	+0.05483 1.5078	+0.000411 2.7743	+0.0184 5.5985
SEP.17 (0H) (2447421.5)	X:	-0.1199	+0.00024	+72.7627 6.117299	+0.13595 3.4320	+0.000934 4.8038	+0.0388 4.3947
A OCT. 3 (0H)	Y:	-0.0139	+0.00000	+33.7595 1.553258	+0.05998 5.1259	+0.000349 0.1634	+0.0180 6.1142
OCT. 1 (0H) (2447435.5)	X:	-0.1166	+0.00022	+71.1088 0.444278	+0.14385 4.2360	+0.000837 5.6247	+0.0377 5.6263
A OCT.17 (0H)	Y:	-0.0138	-0.00002	+33.0118 2.165050	+0.06327 5.9013	+0.000302 1.0099	+0.0175 1.0660
OCT.17 (0H) (2447451.5)	X:	-0.1128	+0.00021	+69.3914 3.827903	+0.15078 1.5346	+0.000716 2.9612	+0.0366 6.1352
A NOV. 2 (0H)	Y:	-0.0142	-0.00002	+32.2109 5.551711	+0.06557 3.1706	+0.000250 4.6661	+0.0170 1.5778
NOV. 1 (0H) (2447466.5)	X:	-0.1099	+0.00021	+68.0254 5.816604	+0.15546 3.6873	+0.000658 5.1914	+0.0358 3.8527
A NOV.17 (0H)	Y:	-0.0147	-0.00005	+31.5423 1.261099	+0.06659 5.2992	+0.000225 0.6538	+0.0166 5.5822
NOV.17 (0H) (2447482.5)	X:	-0.1066	+0.00017	+66.8803 2.906858	+0.15809 0.9440	+0.000594 2.5364	+0.0348 4.3473
A DEC. 3 (0H)	Y:	-0.0156	-0.00005	+30.9364 4.639597	+0.06639 2.5308	+0.000202 4.3741	+0.0161 6.0828
DEC. 1 (0H) (2447496.5)	X:	-0.1042	+0.00014	+66.1761 3.499750	+0.15884 1.6743	+0.000586 3.3391	+0.0343 5.5634
A DEC.17 (0H)	Y:	-0.0164	-0.00006	+30.5091 5.237537	+0.06520 3.2404	+0.000209 5.2411	+0.0158 1.0216
DEC.17 (0H) (2447512.5)	X:	-0.1018	+0.00011	+65.7314 0.585230	+0.15809 5.1992	+0.000596 0.6651	+0.0338 6.0511
A DEC.33 (0H)	Y:	-0.0175	-0.00007	+30.1464 2.329302	+0.06270 0.4607	+0.000234 2.5863	+0.0155 1.5155

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 6 DE SATURNE: TITAN N=0.394

		AO	A1	BO FO	B1 F1	CO PO
JAN. 1 (OH)	X:	- 1.2031	- 0.77169	+157.7745	+ 0.91311	+2.5377
(2447161.5)				4.639717	2.6183	1.7913
A JAN.12 (OH)	Y:	+ 0.0888	- 0.24126	+ 70.0875	+ 0.20580	+1.0868
				0.066526	3.5458	3.4737
JAN.12 (OH)	X:	+ 0.3435	- 1.07650	+149.1717	+ 1.15343	+1.6324
(2447172.5)				2.696577	2.2079	4.0325
A JAN.23 (OH)	Y:	- 1.0118	- 0.06817	+ 69.3004	+ 0.24887	+0.8717
				4.407121	3.4374	5.8718
JAN.23 (OH)	X:	- 0.3183	- 1.02643	+152.6524	+ 0.57047	+2.1587
(2447183.5)				0.652117	2.5265	0.5164
A FEV. 3 (OH)	Y:	- 2.2032	+ 0.15160	+ 70.6975	+ 0.09917	+0.9382
				2.414922	5.7837	2.1720
FEV. 1 (OH)	X:	- 6.6823	+ 0.27593	+156.1466	+ 0.03218	+2.3658
(2447192.5)				4.207979	0.9276	0.9629
A FEV.12 (OH)	Y:	+ 1.5417	- 0.48080	+ 72.1399	+ 0.33025	+1.1486
				5.928456	2.7438	2.6698
FEV.12 (OH)	X:	- 3.6363	- 0.24954	+156.7158	+ 0.67092	+1.9677
(2447203.5)				2.266363	1.5322	3.3879
A FEV.23 (OH)	Y:	+ 1.3550	- 0.48931	+ 72.5355	+ 0.52974	+0.7907
				4.034293	2.7736	5.1659
FEV.23 (OH)	X:	- 1.9671	- 0.60204	+159.3162	+ 0.34427	+2.2576
(2447214.5)				0.261399	1.6560	5.9863
A MAR. 5 (OH)	Y:	+ 0.4785	- 0.34991	+ 70.0153	+ 0.34460	+1.1049
				2.035792	2.4612	1.4453
MAR. 1 (OH)	X:	- 3.0587	- 0.64867	+159.4846	+ 0.89481	+2.0667
(2447221.5)				3.053395	2.8004	4.9104
A MAR.12 (OH)	Y:	- 4.0997	+ 0.48599	+ 69.5221	+ 0.47415	+0.9823
				4.781910	5.3256	0.2924
MAR.12 (OH)	X:	- 6.0667	- 0.11048	+165.7218	+ 0.03533	+2.1846
(2447232.5)				1.070211	0.9187	1.2544
A MAR.23 (OH)	Y:	- 3.9634	+ 0.49052	+ 75.5436	+ 0.30921	+0.9243
				2.796929	5.7618	3.0920
MAR.23 (OH)	X:	- 8.6269	+ 0.32175	+166.1327	+ 0.67540	+2.7039
(2447243.5)				5.417406	5.0425	3.5704
A AVR. 3 (OH)	Y:	- 3.7200	+ 0.46370	+ 76.2983	+ 0.47030	+1.2923
				0.907005	6.0645	5.2877
AVR. 1 (OH)	X:	+ 0.8304	- 1.27083	+165.1054	+ 1.38618	+2.0701
(2447252.5)				2.696410	2.5646	4.1406
A AVR.12 (OH)	Y:	- 2.2595	+ 0.08732	+ 74.9299	+ 0.28122	+0.9987
				4.419868	4.5365	5.9683
AVR.12 (OH)	X:	- 0.4104	- 1.10168	+171.3473	+ 0.93599	+2.4442
(2447263.5)				0.676733	2.3327	0.6398
A AVR.23 (OH)	Y:	- 3.1605	+ 0.26753	+ 78.6083	+ 0.15286	+1.0181
				2.448741	4.8785	2.3264
AVR.23 (OH)	X:	- 2.3292	- 0.85131	+181.4675	+ 0.53965	+2.9861
(2447274.5)				5.054783	3.0902	2.7671
A MAI 4 (OH)	Y:	- 4.1323	+ 0.46072	+ 79.9031	+ 0.41942	+1.3579
				0.557239	5.8188	4.5949

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 6 DE SATURNE: TITAN N=0.394

		A0	A1	B0 F0	B1 F1	C0 P0
MAI 1 (0H) (2447282.5)	X:	- 9.7751	+ 0.72002	+182.8168 1.928006	+ 0.42706 0.0168	+2.1452 2.9044
A MAI 12 (0H)	Y:	+ 1.4003	- 0.48668	+ 80.8433 3.713942	+ 0.42653 2.7265	+0.9131 4.5524
MAI 12 (0H) (2447293.5)	X:	- 7.7243	+ 0.36942	+179.1342 6.272538	+ 0.68989 0.3814	+2.8323 5.3440
A MAI 23 (0H)	Y:	+ 1.7811	- 0.57033	+ 77.4394 1.731800	+ 0.61791 2.4822	+1.2825 0.8947
MAI 23 (0H) (2447304.5)	X:	- 4.5780	- 0.23055	+185.9957 4.328089	+ 0.23899 0.6864	+2.9397 1.2844
A JUN. 3 (0H)	Y:	+ 1.5026	- 0.54586	+ 83.9058 6.046503	+ 0.44473 2.3940	+1.3514 2.9531
JUN. 1 (0H) (2447313.5)	X:	-13.5223	+ 1.19005	+191.9987 1.610722	+ 0.78392 5.5146	+2.1075 2.2675
A JUN.12 (0H)	Y:	- 1.0067	- 0.00341	+ 83.4684 3.356088	+ 0.02902 6.2196	+1.0436 3.9784
JUN.12 (0H) (2447324.5)	X:	-13.4901	+ 1.25943	+180.8024 5.984589	+ 1.11156 6.0217	+3.1526 4.6982
A JUN.23 (0H)	Y:	+ 0.4903	- 0.26687	+ 81.4074 1.413141	+ 0.35393 2.2335	+1.3022 0.1636
JUN.23 (0H) (2447335.5)	X:	-11.5686	+ 0.95938	+183.8935 3.989988	+ 1.13022 5.9143	+2.7988 0.5317
A JUL. 4 (0H)	Y:	+ 1.6350	- 0.48140	+ 85.7567 5.732884	+ 0.47293 2.1368	+1.3614 2.3089
JUL. 1 (0H) (2447343.5)	X:	- 2.1780	- 0.98676	+183.3054 0.869586	+ 1.15105 2.7981	+2.6252 0.9209
A JUL.12 (0H)	Y:	- 4.1971	+ 0.48200	+ 85.6634 2.610681	+ 0.48399 5.2958	-1.0690 2.6481
JUL.12 (0H) (2447354.5)	X:	- 5.5079	- 0.40866	+186.7626 5.252856	+ 0.40424 2.6053	+3.0196 3.1222
A JUL.23 (0H)	Y:	- 4.4192	+ 0.57037	+ 85.1124 0.741492	+ 0.40351 5.5558	+1.4593 4.8977
JUL.23 (0H) (2447365.5)	X:	- 9.0043	+ 0.22572	+181.5443 3.299666	+ 0.53011 5.1722	+2.5503 5.4055
A AOU. 3 (0H)	Y:	- 3.9594	+ 0.53630	+ 79.7086 5.047386	+ 0.45865 6.0162	+1.0943 0.7764
AOU. 1 (0H) (2447374.5)	X:	+ 0.3246	- 1.28197	+178.4661 0.539655	+ 1.33548 2.6196	+2.5477 0.2954
A AOU.12 (0H)	Y:	- 1.3915	- 0.03416	+ 81.9174 2.309217	+ 0.22269 4.3376	+1.1763 1.9334
AOU.12 (0H) (2447385.5)	X:	- 0.3835	- 1.19610	+185.6987 4.929160	+ 1.19973 2.4026	+3.0550 2.3981
A AOU.23 (0H)	Y:	- 2.6424	+ 0.21257	+ 82.0051 0.393836	+ 0.22523 4.5763	+1.3202 4.1894
AOU.23 (0H) (2447396.5)	X:	- 2.2282	- 0.89530	+172.5613 3.005444	+ 0.52388 2.6314	+2.1212 4.7120
A SEP. 3 (0H)	Y:	- 3.4270	+ 0.38611	+ 77.3993 4.709813	+ 0.26599 5.7602	+1.0581 0.1182

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 6 DE SATURNE: TITAN N=0.394

		A0	A1	B0 F0	B1 F1	C0 P0
SEP. 1 (OH)	X:	- 3.7346	- 0.38448	+171.7051	+ 0.51485	+2.5007
(2447405.5)				0.225454	2.4679	5.8025
A SEP.12 (OH)	Y:	+ 1.4302	- 0.49096	+ 75.9571	+ 0.33872	+1.2372
				1.976333	2.9164	1.2824
SEP.12 (OH)	X:	- 1.5809	- 0.78011	+175.1716	+ 0.98492	+2.7893
(2447416.5)				4.581753	2.1132	1.7034
A SEP.23 (OH)	Y:	+ 0.4058	- 0.32084	+ 78.5288	+ 0.41078	+1.2138
				0.005184	3.0633	3.3705
SEP.23 (OH)	X:	- 0.4847	- 0.99374	+162.7119	+ 0.67819	+1.9901
(2447427.5)				2.650995	2.0927	3.9727
A OCT. 4 (OH)	Y:	- 0.5540	- 0.14993	+ 76.3517	+ 0.21573	+0.9303
				4.366323	2.5824	5.8100
OCT. 1 (OH)	X:	-12.2648	+ 1.04545	+160.3511	+ 0.71478	+2.7081
(2447435.5)				5.796054	5.2765	4.2704
A OCT.12 (OH)	Y:	- 1.2932	+ 0.10155	+ 75.1236	+ 0.18205	+1.1890
				1.227028	5.8000	5.9348
OCT.12 (OH)	X:	-11.9235	+ 1.07106	+159.5814	+ 0.83073	+2.3962
(2447446.5)				3.766188	6.0524	0.0270
A OCT.23 (OH)	Y:	- 0.2037	- 0.10255	+ 74.3038	+ 0.21108	+1.0851
				5.528276	2.3443	1.8486
OCT.23 (OH)	X:	-11.5158	+ 1.07274	+165.6668	+ 1.25820	+1.7946
(2447457.5)				1.844712	5.8259	2.7058
A NOV. 3 (OH)	Y:	+ 0.8582	- 0.29805	+ 73.6338	+ 0.37957	+0.8447
				3.605648	1.8360	4.3300
NOV. 1 (OH)	X:	- 7.1438	+ 0.10665	+156.9944	+ 0.48406	+2.4837
(2447466.5)				5.382309	3.7612	3.4297
A NOV.12 (OH)	Y:	- 3.5806	+ 0.46126	+ 73.1474	+ 0.49724	+1.2225
				0.863849	5.5377	5.1589
NOV.12 (OH)	X:	- 8.8824	+ 0.46862	+154.4629	+ 0.26767	+2.2212
(2447477.5)				3.381951	6.0073	5.6057
A NOV.23 (OH)	Y:	- 3.0357	+ 0.37294	+ 68.5537	+ 0.19971	+0.9293
				5.147605	5.7102	1.0303
NOV.23 (OH)	X:	-11.0590	+ 0.91244	+159.8474	+ 1.12696	+1.7502
(2447488.5)				1.442967	5.5802	1.9154
A DEC. 4 (OH)	Y:	- 2.1188	+ 0.22715	+ 70.8265	+ 0.31127	+0.8785
				3.166374	0.3381	3.7182
DEC. 1 (OH)	X:	- 0.6988	- 0.79524	+158.3351	+ 1.02289	+2.5382
(2447496.5)				4.577334	2.4782	1.7906
A DEC.12 (OH)	Y:	- 0.3885	- 0.20490	+ 70.1522	+ 0.27283	+1.0804
				0.022975	3.5429	3.4974
DEC.12 (OH)	X:	+ 0.5975	- 1.03708	+147.8632	+ 0.98608	+1.8136
(2447507.5)				2.628231	2.1020	4.0186
A DEC.23 (OH)	Y:	- 1.3505	- 0.04809	+ 68.3841	+ 0.20122	+0.8596
				4.358231	3.0889	5.8745
DEC.23 (OH)	X:	+ 0.1057	- 1.01227	+150.4499	+ 0.59891	+2.0883
(2447518.5)				0.582806	2.8547	0.5065
A DEC.34 (OH)	Y:	- 2.5988	+ 0.18012	+ 69.1844	+ 0.21354	+0.8957
				2.364364	5.7517	2.1820

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 7 DE SATURNE: HYPERION N=0.394

		A0	A1	B0 F0	B1 F1	C0 P0
JAN. 1 (0H) (2447161.5)	X:	+35.7652	- 9.11930	+123.5279 2.589277	+10.54115 1.1007	+1.3669 2.9779
A JAN. 9 (0H)	Y:	-28.8658	+ 1.19437	+ 65.0320 4.249742	+ 5.47237 2.6157	+0.3198 4.6256
JAN. 9 (0H) (2447169.5)	X:	-37.7856	+11.10546	+138.5824 4.643187	+ 5.24552 2.7505	+2.5594 3.2381
A JAN.17 (0H)	Y:	+ 4.0044	- 0.35036	+ 74.2527 0.199177	+ 3.92593 4.6099	+1.4506 4.9450
JAN.17 (0H) (2447177.5)	X:	+54.3751	- 5.67911	+164.8196 0.816869	+13.06951 5.0046	+1.2308 4.1179
A JAN.25 (0H)	Y:	-19.5177	- 0.73917	+ 76.7821 2.664974	+ 6.29457 0.6058	+0.5164 6.1184
JAN.25 (0H) (2447185.5)	X:	- 2.9721	- 4.13604	+144.7614 3.209289	+10.10688 1.7202	+1.6325 5.7409
A FEV. 2 (0H)	Y:	-36.4386	+ 5.32991	+ 53.7246 4.804969	+ 2.60394 3.4853	+0.9922 0.9551
FEV. 1 (0H) (2447192.5)	X:	-16.6998	+10.32370	+143.4122 5.180696	+ 6.06917 3.3309	+2.7201 4.4385
A FEV. 9 (0H)	Y:	+ 9.8449	- 2.29146	+ 75.4053 0.595648	+ 4.00322 4.8463	+1.2042 5.9825
FEV. 9 (0H) (2447200.5)	X:	+42.8082	- 4.06516	+162.6943 1.334246	+14.08485 5.6751	+1.2906 5.6239
A FEV.17 (0H)	Y:	-21.3077	- 0.48494	+ 74.8482 3.132165	+ 6.57202 1.1916	+0.5889 1.0913
FEV.17 (0H) (2447208.5)	X:	-28.2935	+ 2.17673	+161.9804 3.515989	+ 9.39131 1.8428	+2.9669 0.6978
A FEV.25 (0H)	Y:	-25.5846	+ 4.56560	+ 60.1785 5.338058	+ 3.10704 3.9453	+1.0620 2.3763
FEV.25 (0H) (2447216.5)	X:	+30.8901	+ 4.31736	+169.5707 5.977422	+ 9.76881 3.9571	+1.7757 6.2140
A MAR. 4 (0H)	Y:	+12.4787	- 5.47999	+ 67.7678 1.282197	+ 3.42912 5.2715	+0.8405 2.1601
MAR. 1 (0H) (2447221.5)	X:	+47.9037	- 4.31574	+169.3046 1.175627	+14.38479 5.4911	+1.2740 5.2951
A MAR. 9 (0H)	Y:	-21.1316	- 0.50735	+ 77.7142 2.984202	+ 6.73664 1.0186	+0.6027 0.7842
MAR. 9 (0H) (2447229.5)	X:	-22.2703	+ 0.71104	+166.1931 3.400158	+ 9.92806 1.7639	+2.8594 0.4475
A MAR.17 (0H)	Y:	-29.3314	+ 4.98144	+ 60.3082 5.176522	+ 2.99331 3.8122	+1.0586 2.0323
MAR.17 (0H) (2447237.5)	X:	+21.9924	+ 6.51216	+168.7143 5.854024	+ 9.05059 3.8892	+2.1965 5.9576
A MAR.25 (0H)	Y:	+14.2956	- 5.39631	+ 71.6898 1.138106	+ 3.65798 5.1379	+0.8280 1.8324
MAR.25 (0H) (2447245.5)	X:	+45.8141	- 6.25239	+156.0478 1.949687	+13.45292 0.2400	+1.0324 1.3870
A AVR. 2 (0H)	Y:	-21.9876	- 0.89753	+ 74.4085 3.791937	+ 6.84643 2.0778	+0.5946 2.9826

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 7 DE SATURNE: HYPERION N=0.394

		A0	A1	B0 F0	B1 F1	C0 P0
AVR. 1 (OH)	X:	-35.5124	+ 5.33587	+174.8741	+ 9.10684	+3.4776
(2447252.5)				3.806419	2.0582	1.5063
A AVR. 9 (OH)	Y:	-18.1683	+ 3.97415	+ 68.9128	+ 3.59090	+1.2932
				5.712339	4.2455	3.4046
AVR. 9 (OH)	X:	+62.5894	- 2.36374	+199.7442	+13.78623	+0.8281
(2447260.5)				6.245814	4.0965	1.7085
A AVR.17 (OH)	Y:	+ 2.9057	- 4.75554	+ 73.7040	+ 4.28201	+0.6911
				1.733357	5.8522	3.0820
AVR.17 (OH)	X:	+51.8061	-11.00194	+139.6658	+11.18750	+1.6283
(2447268.5)				2.451822	1.0392	3.2138
A AVR.25 (OH)	Y:	-31.1327	+ 1.23745	+ 73.6026	+ 5.90077	+0.3593
				4.149839	2.5551	5.0695
AVR.25 (OH)	X:	-36.9381	+11.98815	+166.0918	+ 6.49867	+2.9193
(2447276.5)				4.564653	2.6304	3.3173
A MAI 3 (OH)	Y:	+ 4.3175	- 0.21287	+ 85.1812	+ 4.49656	+1.5972
				0.148240	4.5561	5.0344
MAI 1 (OH)	X:	+71.5737	- 4.92909	+207.8828	+15.13063	+1.1546
(2447282.5)				0.136107	4.2535	2.6550
A MAI 9 (OH)	Y:	- 4.6693	- 3.63049	+ 80.4207	+ 5.29364	+0.4667
				1.984850	6.1652	3.7290
MAI 9 (OH)	X:	+47.6962	-11.81239	+143.6643	+11.30553	+1.7440
(2447290.5)				2.674436	1.3411	3.7596
A MAI 17 (OH)	Y:	-36.9546	+ 2.90980	+ 72.7310	+ 4.99380	+0.6308
				4.267052	2.7176	6.0858
MAI 17 (OH)	X:	-28.6394	+12.03787	+169.8373	+ 6.74687	+2.9920
(2447298.5)				4.821393	2.9132	3.8794
A MAI 25 (OH)	Y:	+ 8.0622	- 1.24895	+ 88.6508	+ 4.68821	+1.5145
				0.335006	4.6668	5.4794
MAI 25 (OH)	X:	+55.2326	- 4.52088	+195.2519	+16.06869	+1.2991
(2447306.5)				1.041794	5.3446	5.0331
A JUN. 2 (OH)	Y:	-21.4570	- 0.65519	+ 89.0294	+ 7.50571	+0.6287
				2.849973	0.8757	0.5518
JUN. 1 (OH)	X:	+ 7.5625	- 5.87868	+172.9476	+11.52804	+1.9696
(2447313.5)				3.110270	1.6388	5.7654
A JUN. 9 (OH)	Y:	-41.1704	+ 5.86520	+ 66.4714	+ 3.03217	+1.1658
				4.694765	3.3000	1.0015
JUN. 9 (OH)	X:	- 5.0946	+11.19250	+173.2053	+ 7.47357	+2.9900
(2447321.5)				5.449630	3.5836	5.2000
A JUN.17 (OH)	Y:	+14.5185	- 3.93514	+ 87.3452	+ 4.54855	+1.0177
				0.793426	4.9364	0.5313
JUN.17 (OH)	X:	+46.5639	- 4.16848	+188.2974	+16.25670	+1.2916
(2447329.5)				1.608169	6.0553	0.1960
A JUN.25 (OH)	Y:	-20.7877	- 1.21956	+ 84.7249	+ 7.46813	+0.6070
				3.424704	1.6153	2.0834
JUN.25 (OH)	X:	-35.6464	+ 4.94679	+191.2574	+ 9.93169	+3.6500
(2447337.5)				3.783493	2.0255	1.4549
A JUL. 3 (OH)	Y:	-20.8074	+ 4.40967	+ 75.7907	+ 3.84635	+1.3573
				5.661963	4.1804	3.3222

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 7 DE SATURNE: HYPERION N=0.394

		A0	A1	B0 F0	B1 F1	C0 P0
JUL. 1 (0H) (2447343.5)	X:	+10.9648	+ 8.86753	+181.9595 5.713147	+ 8.88291 3.7888	+2.6489 5.6887
A JUL. 9 (0H)	Y:	+16.2190	- 5.18561	+ 84.0452 0.996453	+ 4.30502 5.0370	+0.8542 1.3621
JUL. 9 (0H) (2447351.5)	X:	+48.3091	- 5.68974	+177.6850 1.837600	+14.95321 0.0755	+0.9837 0.9414
A JUL.17 (0H)	Y:	-21.1063	- 1.32203	+ 83.4054 3.670463	+ 7.43207 1.9278	+0.6007 2.7009
JUL.17 (0H) (2447359.5)	X:	-41.4325	+ 7.54994	+185.6584 3.990928	+ 8.84737 2.1517	+3.4892 1.9271
A JUL.25 (0H)	Y:	-14.4877	+ 3.62003	+ 78.8461 5.911922	+ 4.06175 4.3536	+1.4674 3.8940
JUL.25 (0H) (2447367.5)	X:	+68.2708	- 4.68661	+210.2858 0.168908	+15.10239 4.2841	+1.0964 2.6724
A AOU. 2 (0H)	Y:	- 4.0013	- 3.57532	+ 83.5700 1.997523	+ 5.45213 6.1754	+0.4458 3.7271
AOU. 1 (0H) (2447374.5)	X:	+53.3175	-10.78624	+147.3913 2.389534	+11.31906 0.9143	+1.3738 3.1145
A AOU. 9 (0H)	Y:	-29.5418	+ 0.69569	+ 78.8899 4.101391	+ 6.33885 2.4678	+0.2732 4.7044
AOU. 9 (0H) (2447382.5)	X:	-39.6881	+11.45184	+168.0357 4.522896	+ 6.68139 2.5688	+2.7571 3.1827
A AOU.17 (0H)	Y:	+ 1.9557	+ 0.46972	+ 86.3875 0.106454	+ 4.54624 4.5412	+1.5669 4.9324
AOU.17 (0H) (2447390.5)	X:	+58.9974	- 4.98743	+191.5767 0.750192	+14.89802 4.9673	+1.1754 4.1668
A AOU.25 (0H)	Y:	-16.8121	- 1.11664	+ 87.6232 2.576757	+ 6.98833 0.5456	+0.5014 6.1426
AOU.25 (0H) (2447398.5)	X:	+ 3.7318	- 4.99499	+165.5485 3.154682	+10.79768 1.6323	+1.8398 5.9891
A SEP. 2 (0H)	Y:	-38.2359	+ 5.54778	+ 64.1891 4.744074	+ 2.92046 3.2973	+1.0419 1.1483
SEP. 1 (0H) (2447405.5)	X:	-18.7234	+11.13258	+158.3948 5.154282	+ 6.50554 3.2562	+2.5912 4.5957
A SEP. 9 (0H)	Y:	+11.0766	- 2.15041	+ 84.4566 0.572780	+ 4.50429 4.8115	+1.1369 6.0832
SEP. 9 (0H) (2447413.5)	X:	+45.2016	- 3.46472	+176.4255 1.347455	+14.88001 5.7219	+1.1538 5.8049
A SEP.17 (0H)	Y:	-17.7009	- 1.06689	+ 80.2498 3.139229	+ 6.81684 1.2467	+0.5071 1.3201
SEP.17 (0H) (2447421.5)	X:	-24.9736	+ 1.84429	+172.4931 3.563563	+ 9.70578 1.8453	+2.9660 0.9779
A SEP.25 (0H)	Y:	-24.9726	+ 4.68761	+ 66.0377 5.365038	+ 3.23687 3.8945	+1.0626 2.6849
SEP.25 (0H) (2447429.5)	X:	+36.5108	+ 2.67655	+180.1813 6.020979	+11.07042 3.9478	+1.0933 0.2129
A OCT. 3 (0H)	Y:	+12.1685	- 5.09478	+ 71.9728 1.355655	+ 3.84378 5.3860	+0.7052 2.4652

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 7 DE SATURNE: HYPERION N=0.394

		A0	A1	B0 F0	B1 F1	C0 P0
OCT. 1 (OH)	X:	+44.1902	- 3.90632	+164.4583	+13.95789	+0.9818
(2447435.5)				1.565969	6.0090	0.1362
A OCT. 9 (OH)	Y:	-16.5425	- 1.32823	+ 75.2095	+ 6.52909	+0.4871
				3.384914	1.5761	2.0553
OCT. 9 (OH)	X:	-29.9159	+ 3.89068	+166.7948	+ 8.88315	+2.9928
(2447443.5)				3.749842	1.9700	1.4675
A OCT.17 (OH)	Y:	-18.8716	+ 4.11453	+ 66.1067	+ 3.31953	+1.1069
				5.614026	4.1037	3.3330
OCT.17 (OH)	X:	+50.2259	- 0.79186	+181.8625	+12.43942	+0.5325
(2447451.5)				6.200495	4.0735	1.5922
A OCT.25 (OH)	Y:	+ 6.1618	- 4.28148	+ 70.1753	+ 4.11534	+0.5429
				1.640522	5.7577	3.0403
OCT.25 (OH)	X:	+50.1444	-10.03092	+126.5276	+ 9.37075	+1.1846
(2447459.5)				2.370584	0.9316	3.3632
A NOV. 2 (OH)	Y:	-26.5715	+ 0.95638	+ 68.7183	+ 5.25376	+0.2312
				4.070350	2.4409	5.4431
NOV. 1 (OH)	X:	-37.1952	+ 8.76627	+153.8860	+ 6.85853	+2.4864
(2447466.5)				4.192150	2.2352	2.5597
A NOV. 9 (OH)	Y:	- 4.5022	+ 1.99789	+ 72.0780	+ 3.80215	+1.3101
				6.127197	4.3993	4.5082
NOV. 9 (OH)	X:	+57.6509	- 3.94694	+173.2614	+13.28821	+1.0088
(2447474.5)				0.406731	4.5919	3.6187
A NOV.17 (OH)	Y:	- 7.7263	- 1.90500	+ 74.4067	+ 5.62370	+0.3017
				2.255612	0.2148	5.4612
NOV.17 (OH)	X:	+26.1384	- 7.96332	+133.9886	+ 9.25028	+1.1509
(2447482.5)				2.869886	1.4546	5.1585
A NOV.25 (OH)	Y:	-33.7949	+ 4.15299	+ 59.8752	+ 3.05313	+0.8399
				4.408055	2.8325	0.7179
NOV.25 (OH)	X:	-15.7474	+10.35846	+139.4190	+ 5.81887	+2.0695
(2447490.5)				5.101724	3.1627	4.7681
A DEC. 3 (OH)	Y:	+11.4996	- 1.92206	+ 74.5752	+ 4.10793	+0.8535
				0.544950	4.7668	6.2326
DEC. 1 (OH)	X:	+53.4635	- 3.46919	+165.3007	+13.14836	+0.9575
(2447496.5)				0.640261	4.8960	4.3112
A DEC. 9 (OH)	Y:	-10.1935	- 1.34208	+ 73.1888	+ 5.88187	+0.4016
				2.479574	0.4847	6.2597
DEC. 9 (OH)	X:	+11.1730	- 5.13879	+142.9868	+ 9.19755	+1.6200
(2447504.5)				3.021802	1.5070	6.0646
A DEC.17 (OH)	Y:	-31.5712	+ 4.59863	+ 57.2267	+ 2.59067	+0.8927
				4.614628	3.0713	1.2575
DEC.17 (OH)	X:	- 4.6905	+ 9.58339	+140.0626	+ 6.34215	+1.9428
(2447512.5)				5.343701	3.4054	5.3301
A DEC.25 (OH)	Y:	+14.6657	- 3.07402	+ 71.8195	+ 4.00328	+0.5777
				0.709739	4.8308	0.7071
DEC.25 (OH)	X:	+47.3562	- 3.76376	+149.3757	+12.60622	+0.7509
(2447520.5)				1.477899	5.9742	0.3672
A DEC.33 (OH)	Y:	-12.1059	- 1.58375	+ 66.3914	+ 5.78132	+0.4216
				3.343939	1.5978	2.3411

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 8 DE SATURNE: JAPET N=0.079

		A0	A1	B0 F0	C0 P0
JAN. 1 (OH) (2447161.5)	X:	-23.5982	- 0.64032	+430.2660 3.864203	+ 9.2934 0.0779
A JAN.17 (OH)	Y:	+ 0.5956	+ 0.38496	+128.9518 6.170585	+ 2.5253 2.0287
JAN.17 (OH) (2447177.5)	X:	-37.9006	+ 2.86272	+404.6763 4.995492	+ 3.7669 1.5506
A FEV. 2 (OH)	Y:	+12.3796	- 0.50080	+128.7718 1.026292	+ 1.9192 3.4011
FEV. 1 (OH) (2447192.5)	X:	-11.9504	+ 1.31887	+423.8528 6.238699	+ 8.9753 4.3166
A FEV.17 (OH)	Y:	+12.1191	- 0.73259	+119.4269 2.239596	+ 2.1774 0.6730
FEV.17 (OH) (2447208.5)	X:	-18.1999	+ 1.07911	+457.7866 1.243778	+ 9.0231 5.8934
A MAR. 4 (OH)	Y:	+ 6.9705	- 0.65079	+124.6030 3.563889	+ 2.6537 2.2456
MAR. 1 (OH) (2447221.5)	X:	-32.7469	- 0.14687	+473.7787 2.183417	+ 4.1982 3.1241
A MAR.17 (OH)	Y:	+ 1.5355	+ 0.45318	+132.0649 4.447917	+ 2.3248 5.4841
MAR.17 (OH) (2447237.5)	X:	-73.2573	+ 4.88702	+528.7152 3.319081	+14.9202 5.1341
A AVR. 2 (OH)	Y:	+13.4569	- 0.57750	+144.8116 5.721240	+ 3.3961 1.4694
AVR. 1 (OH) (2447252.5)	X:	-17.7996	+ 0.34757	+494.7984 4.634579	+ 8.0269 1.7650
A AVR.17 (OH)	Y:	+ 7.0371	- 0.04345	+134.9589 0.650850	+ 1.9185 4.2188
AVR.17 (OH) (2447268.5)	X:	-13.0335	- 0.29348	+513.8619 5.916632	+12.4520 3.8410
A MAI 3 (OH)	Y:	- 2.0928	+ 0.37415	+148.7034 1.950989	+ 4.2193 5.8574
MAI 1 (OH) (2447282.5)	X:	+ 0.0432	- 3.77674	+541.9518 0.642065	+ 7.1106 0.2413
A MAI 17 (OH)	Y:	-13.0045	+ 1.94937	+175.4755 2.948396	+ 1.4499 5.6555
MAI 17 (OH) (2447298.5)	X:	-24.7039	- 1.44853	+511.2041 1.993524	+13.7021 1.9963
A JUN. 2 (OH)	Y:	- 4.2832	+ 1.66926	+148.9887 4.136170	+ 5.2276 4.6755
JUN. 1 (OH) (2447313.5)	X:	+ 5.6319	- 2.83909	+498.1470 3.316399	+ 6.7473 2.7124
A JUN.17 (OH)	Y:	- 4.3521	+ 1.65676	+125.7642 5.492021	+ 4.6757 5.2293
JUN.17 (OH) (2447329.5)	X:	- 3.3280	- 0.99160	+546.8968 4.557847	+ 4.3920 1.3372
A JUL. 3 (OH)	Y:	- 5.5440	+ 0.99010	+153.5172 0.653113	+ 3.6696 4.6323

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 8 DE SATURNE: JAPET N=0.079

		AO	A1	BO FO	CO PO
JUL. 1 (OH) (2447343.5)	X:	-16.4685	- 1.43950	+556.1905 5.671962	+ 6.2887 3.2644
A JUL.17 (OH)	Y:	- 2.3892	+ 0.25531	+165.8531 1.669705	+ 2.2440 5.5013
JUL.17 (OH) (2447359.5)	X:	-44.6488	+ 1.47902	+523.9607 0.715665	+10.8253 5.9275
A AOU. 2 (OH)	Y:	+ 0.7591	+ 0.49490	+166.3396 2.925695	+ 2.4483 2.3496
AOU. 1 (OH) (2447374.5)	X:	-31.2789	+ 1.61948	+533.8110 1.895213	+ 9.8446 2.1307
A AOU.17 (OH)	Y:	+10.3413	- 0.63830	+158.3491 4.220527	+ 3.3002 3.8547
AOU.17 (OH) (2447390.5)	X:	- 5.9433	+ 0.11645	+509.9601 3.160048	+ 9.7048 4.4037
A SEP. 2 (OH)	Y:	+ 4.9256	- 0.71460	+166.0078 5.479514	+ 2.1439 0.8396
SEP. 1 (OH) (2447405.5)	X:	-16.4535	- 1.42753	+487.5797 4.384062	+ 5.9970 0.4170
A SEP.17 (OH)	Y:	+ 3.1976	- 0.18417	+155.9853 0.329191	+ 3.1758 2.3703
SEP.17 (OH) (2447421.5)	X:	-33.9165	+ 0.21445	+472.7857 5.604957	+ 5.0517 2.4667
A OCT. 3 (OH)	Y:	+ 8.6667	- 0.07077	+145.2712 1.589403	+ 0.9844 4.1565
OCT. 1 (OH) (2447435.5)	X:	-18.6828	- 0.02273	+465.7695 0.396284	+ 1.8997 5.7672
A OCT.17 (OH)	Y:	+14.9858	- 0.69058	+131.1446 2.725083	+ 2.5032 1.8482
OCT.17 (OH) (2447451.5)	X:	+17.3477	- 2.54758	+417.0336 1.579947	+12.7591 1.8637
A NOV. 2 (OH)	Y:	+ 4.9904	- 0.47058	+133.5272 3.986171	+ 2.3049 4.1025
NOV. 1 (OH) (2447466.5)	X:	+ 8.4346	- 2.54215	+407.5822 2.854067	+ 5.2623 3.7084
A NOV.17 (OH)	Y:	- 0.2633	- 0.40255	+135.5594 5.157121	+ 2.5867 0.5192
NOV.17 (OH) (2447482.5)	X:	+ 1.1484	- 4.08153	+434.8500 4.206439	+11.0148 0.9631
A DEC. 3 (OH)	Y:	- 4.8078	+ 0.76328	+118.0479 0.133661	+ 1.8338 2.3876
DEC. 1 (OH) (2447496.5)	X:	-42.0106	+ 2.17500	+403.5953 5.076055	+ 3.9773 1.4939
A DEC.17 (OH)	Y:	+ 9.8685	- 0.11351	+118.2963 1.114059	+ 1.5707 3.3651
DEC.17 (OH) (2447512.5)	X:	- 1.9981	- 0.35810	+433.7529 0.038734	+ 2.9194 3.9619
A DEC.33 (OH)	Y:	+11.9963	- 0.35546	+111.2932 2.384826	+ 1.1322 0.8448

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.

$$\Delta\alpha \cos\delta = X$$
$$\Delta\delta = Y$$

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

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)*	

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 5 D'URANUS: MIRANDA N=4.4880

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
JANVIER							
JAN. 1 (OH)	X:	-0.0264	-0.00001	+ 8.6742	+0.37621	+0.008033	+0.0123
(2447161.5)				2.270473	0.6995	5.2402	3.3522
A JAN. 9 (OH)	Y:	-0.0238	+0.00003	+ 8.6254	+0.37630	+0.008041	+0.0103
				3.800385	2.2342	0.4979	4.8513
JAN. 9 (OH)	X:	-0.0267	-0.00001	+ 8.6754	+0.37618	+0.007894	+0.0112
(2447169.5)				0.132463	4.8445	3.0977	5.3811
A JAN.17 (OH)	Y:	-0.0235	+0.00000	+ 8.6441	+0.37808	+0.007892	+0.0119
				1.660598	0.0931	4.6176	0.5134
JAN.17 (OH)	X:	-0.0267	+0.00000	+ 8.6828	+0.37476	+0.007879	+0.0117
(2447177.5)				4.277831	2.7094	0.9847	1.0133
A JAN.25 (OH)	Y:	-0.0240	+0.00000	+ 8.6695	+0.37652	+0.007787	+0.0115
				5.803926	4.2377	2.5124	2.6488
JAN.25 (OH)	X:	-0.0269	-0.00002	+ 8.6959	+0.37555	+0.007997	+0.0122
(2447185.5)				2.140785	0.5771	5.1251	3.1113
A FEV. 2 (OH)	Y:	-0.0237	+0.00002	+ 8.6978	+0.37776	+0.008055	+0.0107
				3.665082	2.1066	0.3737	4.5238
FEVRIER							
FEV. 1 (OH)	X:	-0.0270	-0.00003	+ 8.7145	+0.37610	+0.007976	+0.0112
(2447192.5)				1.842046	0.2799	4.8275	2.5407
A FEV. 9 (OH)	Y:	-0.0237	+0.00001	+ 8.7307	+0.37893	+0.008093	+0.0118
				3.364877	1.8088	0.0721	3.8964
FEV. 9 (OH)	X:	-0.0276	-0.00002	+ 8.7444	+0.37670	+0.007755	+0.0112
(2447200.5)				5.989010	4.4243	2.6940	4.4110
A FEV.17 (OH)	Y:	-0.0235	+0.00000	+ 8.7763	+0.38110	+0.007975	+0.0123
				1.227326	5.9529	4.2053	6.0097
FEV.17 (OH)	X:	-0.0275	-0.00001	+ 8.7772	+0.37622	+0.007879	+0.0124
(2447208.5)				3.852977	2.2933	0.5886	0.2182
A FEV.25 (OH)	Y:	-0.0238	+0.00000	+ 8.8262	+0.38098	+0.007977	+0.0111
				5.373084	3.8174	2.0954	1.6901
FEV.25 (OH)	X:	-0.0278	-0.00004	+ 8.8162	+0.37925	+0.008017	+0.0109
(2447216.5)				1.717875	0.1618	4.7140	2.2533
A MAR. 4 (OH)	Y:	-0.0237	+0.00001	+ 8.8782	+0.38340	+0.008181	+0.0124
				3.236640	1.6859	6.2364	3.6482
MARS							
MAR. 1 (OH)	X:	-0.0283	-0.00003	+ 8.8466	+0.38058	+0.007807	+0.0120
(2447221.5)				5.095927	3.5360	1.8022	2.7071
A MAR. 9 (OH)	Y:	-0.0238	+0.00000	+ 8.9173	+0.38327	+0.007970	+0.0120
				0.330651	5.0593	3.3502	4.1289
MAR. 9 (OH)	X:	-0.0283	-0.00002	+ 8.8936	+0.38119	+0.008015	+0.0110
(2447229.5)				2.960917	1.4068	5.9738	4.6234
A MAR.17 (OH)	Y:	-0.0236	+0.00002	+ 8.9756	+0.38526	+0.008216	+0.0125
				4.478167	2.9287	1.2190	6.2497
MAR.17 (OH)	X:	-0.0286	-0.00005	+ 8.9466	+0.38503	+0.008117	+0.0126
(2447237.5)				0.826758	5.5576	3.8155	0.3375
A MAR.25 (OH)	Y:	-0.0234	+0.00000	+ 9.0396	+0.38889	+0.008155	+0.0111
				2.343272	0.7916	5.3438	1.9250
MAR.25 (OH)	X:	-0.0293	-0.00003	+ 9.0065	+0.38649	+0.007975	+0.0119
(2447245.5)				4.975607	3.4203	1.6923	2.4453
A AVR. 2 (OH)	Y:	-0.0238	+0.00000	+ 9.1054	+0.38957	+0.008073	+0.0126
				0.208360	4.9380	3.2338	3.8753

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 5 D'URANUS: MIRANDA N=4.4880

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
AVRIL							
AVR. 1 (OH) (2447252.5)	X:	-0.0295	-0.00003	+ 9.0580 4.679020	+0.38811 3.1260	+0.008103 1.4055	+0.0116 1.7968
A AVR. 9 (OH)	Y:	-0.0238	+0.00000	+ 9.1623 6.194821	+0.39165 4.6400	+0.008066 2.9360	+0.0130 3.3331
AVR. 9 (OH) (2447260.5)	X:	-0.0297	-0.00003	+ 9.1175 2.544996	+0.39037 0.9955	+0.008313 5.5602	+0.0127 3.7547
A AVR.17 (OH)	Y:	-0.0235	+0.00003	+ 9.2226 4.060866	+0.39452 2.5109	+0.008396 0.7967	+0.0113 5.3846
AVR.17 (OH) (2447268.5)	X:	-0.0301	-0.00005	+ 9.1797 0.411318	+0.39402 5.1435	+0.008329 3.4111	+0.0126 5.8551
A AVR.25 (OH)	Y:	-0.0231	+0.00000	+ 9.2860 1.927419	+0.39862 0.3722	+0.008281 4.9157	+0.0121 0.9634
AVR.25 (OH) (2447276.5)	X:	-0.0306	-0.00003	+ 9.2419 4.560468	+0.39564 3.0075	+0.008325 1.2911	+0.0119 1.5094
A MAI 3 (OH)	Y:	-0.0236	+0.00001	+ 9.3450 6.076715	+0.39878 4.5187	+0.008218 2.8109	+0.0130 3.0989
MAI							
MAI 1 (OH) (2447282.5)	X:	-0.0310	-0.00004	+ 9.2870 6.101652	+0.39783 4.5459	+0.008276 2.8263	+0.0118 4.5755
A MAI 9 (OH)	Y:	-0.0230	+0.00001	+ 9.3835 1.335385	+0.40287 6.0614	+0.008418 4.3159	+0.0132 6.1427
MAI 9 (OH) (2447290.5)	X:	-0.0311	-0.00002	+ 9.3417 3.967360	+0.39899 2.4127	+0.008451 0.7130	+0.0133 0.3514
A MAI 17 (OH)	Y:	-0.0232	+0.00002	+ 9.4326 5.484825	+0.40311 3.9257	+0.008433 2.2046	+0.0118 1.8581
MAI 17 (OH) (2447298.5)	X:	-0.0314	-0.00005	+ 9.3916 1.833336	+0.40316 0.2782	+0.008621 4.8334	+0.0119 2.4168
A MAI 25 (OH)	Y:	-0.0229	+0.00004	+ 9.4717 3.351449	+0.40581 1.7939	+0.008686 0.0580	+0.0130 3.7833
MAI 25 (OH) (2447306.5)	X:	-0.0321	-0.00003	+ 9.4391 5.981971	+0.40517 4.4196	+0.008425 2.6955	+0.0123 4.2881
A JUN. 2 (OH)	Y:	-0.0225	+0.00002	+ 9.5078 1.218001	+0.40832 5.9373	+0.008573 4.1893	+0.0131 5.8999
JUIN							
JUN. 1 (OH) (2447313.5)	X:	-0.0325	-0.00002	+ 9.4729 5.684822	+0.40721 4.1188	+0.008411 2.3896	+0.0132 3.6972
A JUN. 9 (OH)	Y:	-0.0224	+0.00003	+ 9.5304 0.921577	+0.40876 5.6390	+0.008617 3.9003	+0.0124 5.2934
JUN. 9 (OH) (2447321.5)	X:	-0.0323	+0.00000	+ 9.5004 3.549357	+0.40740 1.9849	+0.008646 0.2746	+0.0124 5.8338
A JUN.17 (OH)	Y:	-0.0222	+0.00004	+ 9.5472 5.070474	+0.40887 3.5035	+0.008723 1.7759	+0.0129 0.9329
JUN.17 (OH) (2447329.5)	X:	-0.0325	-0.00004	+ 9.5199 1.414091	+0.41123 6.1306	+0.008789 4.3829	+0.0116 1.4088
A JUN.25 (OH)	Y:	-0.0218	+0.00004	+ 9.5539 2.936143	+0.41071 1.3669	+0.008802 5.9051	+0.0134 3.0229
JUN.25 (OH) (2447337.5)	X:	-0.0333	-0.00001	+ 9.5339 5.561093	+0.41164 3.9858	+0.008525 2.2452	+0.0134 3.4470
A JUL. 3 (OH)	Y:	-0.0215	+0.00004	+ 9.5536 0.801193	+0.41081 5.5094	+0.008680 3.7695	+0.0122 4.9962

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 5 D'URANUS: MIRANDA N=4.4880

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
JUILLET							
JUL. 1 (OH)	X:	-0.0329	-0.00003	+ 9.5312	+0.41321	+0.008858	+0.0135
(2447343.5)				0.817219	5.5285	3.7694	0.2183
A JUL. 9 (OH)	Y:	-0.0210	+0.00003	+ 9.5456	+0.41158	+0.008684	+0.0116
				2.341351	0.7636	5.2955	1.7785
JUL. 9 (OH)	X:	-0.0334	+0.00000	+ 9.5263	+0.41262	+0.008686	+0.0124
(2447351.5)				4.963279	3.3847	1.6359	2.2955
A JUL.17 (OH)	Y:	-0.0211	+0.00004	+ 9.5283	+0.40962	+0.008558	+0.0133
				0.205224	4.9061	3.1803	3.7532
JUL.17 (OH)	X:	-0.0332	+0.00000	+ 9.5063	+0.41171	+0.008863	+0.0124
(2447359.5)				2.825589	1.2478	5.7882	4.1796
A JUL.25 (OH)	Y:	-0.0205	+0.00007	+ 9.4974	+0.40957	+0.008816	+0.0124
				4.351986	2.7717	1.0364	5.8746
JUL.25 (OH)	X:	-0.0333	-0.00001	+ 9.4787	+0.41271	+0.008863	+0.0134
(2447367.5)				0.687788	5.3897	3.6237	6.2524
A AOU. 2 (OH)	Y:	-0.0198	+0.00004	+ 9.4632	+0.41047	+0.008645	+0.0116
				2.215147	0.6285	5.1504	1.4505
AOUT							
AOU. 1 (OH)	X:	-0.0334	+0.00000	+ 9.4479	+0.41132	+0.008807	+0.0126
(2447374.5)				0.387261	5.0863	3.3255	5.6914
A AOU. 9 (OH)	Y:	-0.0194	+0.00003	+ 9.4257	+0.41001	+0.008602	+0.0125
				1.915523	0.3261	4.8398	0.8032
AOU. 9 (OH)	X:	-0.0335	+0.00001	+ 9.4050	+0.40887	+0.008740	+0.0123
(2447382.5)				4.531242	2.9441	1.1976	1.3157
A AOU.17 (OH)	Y:	-0.0196	+0.00004	+ 9.3773	+0.40643	+0.008469	+0.0128
				6.060018	4.4676	2.7287	2.9444
AOU.17 (OH)	X:	-0.0333	+0.00000	+ 9.3526	+0.40762	+0.008834	+0.0132
(2447390.5)				2.391754	0.8048	5.3318	3.3624
A AOU.25 (OH)	Y:	-0.0189	+0.00007	+ 9.3191	+0.40560	+0.008731	+0.0111
				3.921132	2.3326	0.5798	4.8673
AOU.25 (OH)	X:	-0.0334	+0.00001	+ 9.2970	+0.40609	+0.008660	+0.0120
(2447398.5)				0.251891	4.9437	3.1803	5.3871
A SEP. 2 (OH)	Y:	-0.0182	+0.00003	+ 9.2627	+0.40539	+0.008518	+0.0127
				1.781780	0.1875	4.6938	0.5231
SEPTEMBRE							
SEP. 1 (OH)	X:	-0.0335	+0.00001	+ 9.2444	+0.40372	+0.008515	+0.0116
(2447405.5)				6.233028	4.6384	2.8798	4.7094
A SEP. 9 (OH)	Y:	-0.0179	+0.00003	+ 9.2083	+0.40365	+0.008519	+0.0130
				1.479907	6.1689	4.3906	6.2631
SEP. 9 (OH)	X:	-0.0331	+0.00003	+ 9.1784	+0.39988	+0.008556	+0.0129
(2447413.5)				4.092145	2.4989	0.7594	0.4501
A SEP.17 (OH)	Y:	-0.0180	+0.00004	+ 9.1452	+0.39961	+0.008433	+0.0114
				5.622046	4.0274	2.2748	1.9948
SEP.17 (OH)	X:	-0.0329	+0.00000	+ 9.1099	+0.39887	+0.008598	+0.0116
(2447421.5)				1.951422	0.3586	4.8764	2.5221
A SEP.25 (OH)	Y:	-0.0175	+0.00006	+ 9.0785	+0.39819	+0.008600	+0.0122
				3.480945	1.8903	0.1243	3.8826
SEP.25 (OH)	X:	-0.0332	+0.00002	+ 9.0436	+0.39577	+0.008287	+0.0116
(2447429.5)				6.093378	4.4955	2.7348	4.3771
A OCT. 3 (OH)	Y:	-0.0169	+0.00003	+ 9.0173	+0.39672	+0.008399	+0.0125
				1.339446	6.0285	4.2513	5.9888

1988 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) (2447435.5)	X:	-0.0326	+0.00000	+ 8.9897 1.345972	+0.39489 6.0347	+0.008444 4.2554	+0.0112 1.1266
A OCT. 9 (OH)	Y:	-0.0167	+0.00004	+ 8.9694 2.874369	+0.39408 1.2835	+0.008476 5.8004	+0.0122 2.8009
OCT. 9 (OH) (2447443.5)	X:	-0.0330	+0.00002	+ 8.9245 5.487596	+0.39124 3.8882	+0.008106 2.1197	+0.0125 3.2152
A OCT.17 (OH)	Y:	-0.0166	+0.00003	+ 8.9112 0.732008	+0.39099 5.4229	+0.008297 3.6701	+0.0114 4.7130
OCT.17 (OH) (2447451.5)	X:	-0.0324	+0.00003	+ 8.8551 3.345855	+0.38699 1.7517	+0.008227 0.0025	+0.0108 5.2409
A OCT.25 (OH)	Y:	-0.0163	+0.00005	+ 8.8536 4.872607	+0.38836 3.2845	+0.008388 1.5365	+0.0125 0.4429
OCT.25 (OH) (2447459.5)	X:	-0.0322	+0.00000	+ 8.7903 1.204756	+0.38631 5.8951	+0.008239 4.1138	+0.0116 0.8157
A NOV. 2 (OH)	Y:	-0.0158	+0.00003	+ 8.8023 2.730142	+0.38730 1.1421	+0.008289 5.6612	+0.0114 2.5025
NOVEMBRE							
NOV. 1 (OH) (2447466.5)	X:	-0.0321	+0.00000	+ 8.7366 0.901824	+0.38387 5.5934	+0.008190 3.8119	+0.0123 0.2577
A NOV. 9 (OH)	Y:	-0.0155	+0.00002	+ 8.7622 2.426118	+0.38567 0.8378	+0.008169 5.3561	+0.0107 1.8286
NOV. 9 (OH) (2447474.5)	X:	-0.0323	+0.00002	+ 8.6814 5.043596	+0.38023 3.4499	+0.007950 1.6833	+0.0113 2.3376
A NOV.17 (OH)	Y:	-0.0157	+0.00002	+ 8.7218 .0.283156	+0.38204 4.9785	+0.008011 3.2429	+0.0121 3.7864
NOV.17 (OH) (2447482.5)	X:	-0.0320	+0.00002	+ 8.6263 2.902386	+0.37696 1.3143	+0.008052 5.8411	+0.0112 4.2155
A NOV.25 (OH)	Y:	-0.0153	+0.00004	+ 8.6841 4.423807	+0.38078 2.8429	+0.008205 1.1007	+0.0114 5.9043
NOV.25 (OH) (2447490.5)	X:	-0.0318	+0.00000	+ 8.5787 0.761863	+0.37597 5.4581	+0.007995 3.6823	+0.0121 6.2825
A DEC. 3 (OH)	Y:	-0.0148	+0.00001	+ 8.6578 2.281649	+0.38071 0.6990	+0.008009 5.2203	+0.0106 1.4795
DECEMBRE							
DEC. 1 (OH) (2447496.5)	X:	-0.0318	+0.00000	+ 8.5463 2.297843	+0.37309 0.7138	+0.008002 5.2396	+0.0119 3.1184
A DEC. 9 (OH)	Y:	-0.0150	+0.00004	+ 8.6391 3.816483	+0.37917 2.2395	+0.008139 0.4878	+0.0105 4.5261
DEC. 9 (OH) (2447504.5)	X:	-0.0319	+0.00000	+ 8.5104 0.157678	+0.37116 4.8556	+0.007792 3.0994	+0.0107 5.0833
A DEC.17 (OH)	Y:	-0.0145	+0.00001	+ 8.6262 1.674826	+0.37937 0.0959	+0.007933 4.6109	+0.0122 0.2623
DEC.17 (OH) (2447512.5)	X:	-0.0317	+0.00001	+ 8.4787 4.300847	+0.36818 2.7194	+0.007797 0.9841	+0.0118 0.7515
A DEC.25 (OH)	Y:	-0.0149	+0.00001	+ 8.6189 5.816141	+0.37657 4.2399	+0.007859 2.5045	+0.0110 2.3535
DEC.25 (OH) (2447520.5)	X:	-0.0317	+0.00000	+ 8.4531 2.161618	+0.36772 0.5840	+0.007847 5.1153	+0.0114 2.8563
A DEC.33 (OH)	Y:	-0.0146	+0.00003	+ 8.6162 3.675217	+0.37698 2.1063	+0.008074 0.3581	+0.0110 4.2053

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 1 D'URANUS: ARIEL N=2.4930

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
JAN. 1 (OH)	X:	+0.0634	+0.00001	+12.8439	+0.00383	+0.000089	+0.0219
(2447161.5)				0.242368	4.8997	0.6236	1.7991
A FEV. 2 (OH)	Y:	-0.0145	+0.00000	+12.8900	+0.00639	+0.000092	+0.0220
				1.787562	0.6000	2.2322	3.3421
FEV. 1 (OH)	X:	+0.0638	+0.00004	+12.9171	+0.00530	+0.000079	+0.0221
(2447192.5)				2.120436	1.7950	2.5926	5.5580
A MAR. 4 (OH)	Y:	-0.0144	+0.00000	+13.0440	+0.00839	+0.000074	+0.0225
				3.661181	3.2475	4.3547	0.8181
MAR. 1 (OH)	X:	+0.0649	+0.00004	+13.1214	+0.00930	+0.000051	+0.0227
(2447221.5)				5.300955	5.3516	5.9664	5.6319
A AVR. 2 (OH)	Y:	-0.0146	-0.00002	+13.3143	+0.01123	+0.000049	+0.0230
				0.555612	0.5093	1.7972	0.8893
AVR. 1 (OH)	X:	+0.0662	+0.00005	+13.4468	+0.01215	+0.000023	+0.0232
(2447252.5)				0.905860	1.1097	3.1244	3.1235
A MAI 3 (OH)	Y:	-0.0156	-0.00002	+13.6756	+0.01254	+0.000051	+0.0234
				2.442422	2.6373	4.9293	4.6565
MAI 1 (OH)	X:	+0.0678	+0.00003	+13.7903	+0.01175	+0.000076	+0.0237
(2447282.5)				0.304165	0.6119	3.4981	1.9087
A JUN. 2 (OH)	Y:	-0.0169	-0.00003	+14.0073	+0.01082	+0.000091	+0.0240
				1.841343	2.2576	4.9249	3.4400
JUN. 1 (OH)	X:	+0.0689	+0.00001	+14.0644	+0.00722	+0.000119	+0.0240
(2447313.5)				2.196477	2.6695	5.5811	5.6771
A JUL. 3 (OH)	Y:	-0.0182	-0.00004	+14.2274	+0.00626	+0.000117	+0.0242
				3.735943	4.5851	0.8247	0.9297
JUL. 1 (OH)	X:	+0.0690	-0.00002	+14.1533	+0.00170	+0.000119	+0.0240
(2447343.5)				1.593391	3.5917	5.0980	4.4523
A AOU. 2 (OH)	Y:	-0.0196	-0.00002	+14.2502	+0.00423	+0.000109	+0.0242
				3.135891	5.4582	0.4686	5.9865
AOU. 1 (OH)	X:	+0.0681	-0.00005	+14.0256	+0.00785	+0.000078	+0.0236
(2447374.5)				3.478713	0.4794	0.8808	1.9178
A SEP. 2 (OH)	Y:	-0.0206	+0.00000	+14.0692	+0.00903	+0.000074	+0.0236
				5.024062	1.8940	2.7107	3.4529
SEP. 1 (OH)	X:	+0.0660	-0.00005	+13.7220	+0.01254	+0.000028	+0.0229
(2447405.5)				5.358183	2.5210	3.3213	5.6616
A OCT. 3 (OH)	Y:	-0.0210	+0.00000	+13.7431	+0.01265	+0.000042	+0.0230
				0.621657	4.0524	5.4599	0.9211
OCT. 1 (OH)	X:	+0.0641	-0.00004	+13.3536	+0.01381	+0.000032	+0.0223
(2447435.5)				4.739868	2.0044	4.5241	4.4104
A NOV. 2 (OH)	Y:	-0.0211	+0.00002	+13.3856	+0.01335	+0.000052	+0.0225
				0.002617	3.6332	5.9108	5.9557
NOV. 1 (OH)	X:	+0.0624	-0.00004	+12.9924	+0.01222	+0.000062	+0.0219
(2447466.5)				0.327967	3.9862	0.4936	1.8689
A DEC. 3 (OH)	Y:	-0.0206	+0.00001	+13.0693	+0.01150	+0.000077	+0.0220
				1.871145	5.7400	1.9267	3.4111
DEC. 1 (OH)	X:	+0.0611	-0.00001	+12.7302	+0.00882	+0.000081	+0.0215
(2447496.5)				5.989452	3.5258	0.0015	0.6256
A DEC.33 (OH)	Y:	-0.0201	+0.00000	+12.8826	+0.00839	+0.000091	+0.0219
				1.245457	5.4877	1.5080	2.1618

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 2 D'URANUS: UMBRIEL N=1.5162

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
JAN. 1 (OH) (2447161.5)	X:	+0.1116	+0.00001	+17.9163 4.168535	+0.00600 2.5666	+0.000120 4.4573	+0.0449 4.2050
A FEV. 2 (OH)	Y:	+0.0776	+0.00005	+17.9958 5.716023	+0.00933 4.5109	+0.000122 6.0672	+0.0452 5.7514
FEV. 1 (OH) (2447192.5)	X:	+0.1120	+0.00006	+18.0214 0.896774	+0.00804 0.4046	+0.000107 1.3083	+0.0454 3.9529
A MAR. 4 (OH)	Y:	+0.0792	+0.00008	+18.2102 2.440150	+0.01223 1.9311	+0.000099 3.0546	+0.0459 5.4954
MAR. 1 (OH) (2447221.5)	X:	+0.1138	+0.00010	+18.3088 0.880224	+0.01306 0.7840	+0.000071 1.5507	+0.0464 3.9223
A AVR. 2 (OH)	Y:	+0.0813	+0.00007	+18.5872 2.420947	+0.01581 2.2613	+0.000066 3.6261	+0.0469 5.4658
AVR. 1 (OH) (2447252.5)	X:	+0.1168	+0.00012	+18.7632 3.900307	+0.01673 3.9923	+0.000039 6.0385	+0.0475 3.6829
A MAI 3 (OH)	Y:	+0.0837	+0.00003	+19.0914 5.439843	+0.01726 5.5237	+0.000076 1.5850	+0.0486 5.2160
MAI 1 (OH) (2447282.5)	X:	+0.1205	+0.00010	+19.2429 5.407880	+0.01598 5.6328	+0.000105 2.1958	+0.0486 0.3984
A JUN. 2 (OH)	Y:	+0.0847	+0.00000	+19.5546 0.664849	+0.01456 0.9803	+0.000129 3.6375	+0.0494 1.9493
JUN. 1 (OH) (2447313.5)	X:	+0.1237	+0.00005	+19.6241 2.150559	+0.00977 2.5753	+0.000163 5.4346	+0.0492 0.1659
A JUL. 3 (OH)	Y:	+0.0847	-0.00005	+19.8619 3.692789	+0.00826 4.4821	+0.000161 0.6819	+0.0497 1.7051
JUL. 1 (OH) (2447343.5)	X:	+0.1254	+0.00000	+19.7467 3.659302	+0.00285 5.6216	+0.000160 0.8044	+0.0492 3.1699
A AOU. 2 (OH)	Y:	+0.0829	-0.00008	+19.8940 5.204356	+0.00610 1.2030	+0.000147 2.4523	+0.0493 4.7092
AOU. 1 (OH) (2447374.5)	X:	+0.1251	-0.00006	+19.5665 0.397949	+0.01087 3.5601	+0.000106 4.0391	+0.0484 2.9067
A SEP. 2 (OH)	Y:	+0.0801	-0.00009	+19.6414 1.945628	+0.01260 4.9979	+0.000099 5.8655	+0.0487 4.4657
SEP. 1 (OH) (2447405.5)	X:	+0.1229	-0.00009	+19.1427 3.414973	+0.01708 0.4775	+0.000041 1.4736	+0.0472 2.6552
A OCT. 3 (OH)	Y:	+0.0770	-0.00006	+19.1865 4.963889	+0.01728 2.0163	+0.000058 3.5379	+0.0472 4.1971
OCT. 1 (OH) (2447435.5)	X:	+0.1198	-0.00010	+18.6288 4.911289	+0.01862 2.0961	+0.000048 4.5241	+0.0457 5.6429
A NOV. 2 (OH)	Y:	+0.0746	-0.00003	+18.6873 0.176309	+0.01788 3.7210	+0.000076 5.9920	+0.0462 0.9012
NOV. 1 (OH) (2447466.5)	X:	+0.1165	-0.00007	+18.1273 1.636839	+0.01644 5.2375	+0.000086 1.6489	+0.0450 5.3710
A DEC. 3 (OH)	Y:	+0.0733	+0.00000	+18.2457 3.182510	+0.01524 0.6985	+0.000109 3.1120	+0.0451 0.6356
DEC. 1 (OH) (2447496.5)	X:	+0.1139	-0.00004	+17.7643 3.128322	+0.01200 0.6470	+0.000110 3.3010	+0.0441 2.0768
A DEC.33 (OH)	Y:	+0.0728	+0.00003	+17.9844 4.670324	+0.01125 2.6038	+0.000126 4.8276	+0.0448 3.6177

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 3 D'URANUS: TITANIA N=0.7217

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
JAN. 1 (OH) (2447161.5)	X:	-0.0731	-0.00002	+29.2983 0.002660	+0.00807 4.6488	+0.000194 0.2087	+0.0323 4.0031
A FEV. 2 (OH)	Y:	+0.0615	+0.00000	+29.4456 1.548761	+0.01374 0.3853	+0.000197 1.8243	+0.0326 5.5489
FEV. 1 (OH) (2447192.5)	X:	-0.0740	-0.00003	+29.4635 3.518636	+0.01270 3.0716	+0.000171 3.8665	+0.0326 4.7573
A MAR. 4 (OH)	Y:	+0.0614	+0.00002	+29.7969 5.060526	+0.01973 4.5827	+0.000155 5.6171	+0.0331 0.0131
MAR. 1 (OH) (2447221.5)	X:	-0.0751	-0.00007	+29.9289 5.594700	+0.02125 5.5022	+0.000115 6.2197	+0.0332 2.6365
A AVR. 2 (OH)	Y:	+0.0625	+0.00005	+30.4143 0.850729	+0.02592 0.6883	+0.000106 2.0637	+0.0338 4.1756
AVR. 1 (OH) (2447252.5)	X:	-0.0776	-0.00003	+30.6698 2.834763	+0.02738 2.9225	+0.000066 4.9308	+0.0343 3.3934
A MAI 3 (OH)	Y:	+0.0638	+0.00006	+31.2397 4.372756	+0.02814 4.4479	+0.000129 0.4537	+0.0349 4.9324
MAI 1 (OH) (2447282.5)	X:	-0.0786	-0.00004	+31.4546 5.640117	+0.02629 5.8708	+0.000173 2.3338	+0.0348 2.7253
A JUN. 2 (OH)	Y:	+0.0660	+0.00006	+31.9968 0.895508	+0.02387 1.2184	+0.000214 3.7830	+0.0354 4.2635
JUN. 1 (OH) (2447313.5)	X:	-0.0802	+0.00001	+32.0816 2.886700	+0.01670 3.3728	+0.000266 6.0893	+0.0355 3.4905
A JUL. 3 (OH)	Y:	+0.0680	+0.00003	+32.4994 4.427385	+0.01448 5.2840	+0.000261 1.3375	+0.0359 5.0347
JUL. 1 (OH) (2447343.5)	X:	-0.0800	+0.00005	+32.2869 5.694922	+0.00701 1.2107	+0.000260 2.7604	+0.0354 2.8115
A AOU. 2 (OH)	Y:	+0.0687	+0.00001	+32.5518 0.955298	+0.01219 3.0939	+0.000234 4.4138	+0.0357 4.3550
AOU. 1 (OH) (2447374.5)	X:	-0.0783	+0.00005	+31.9972 2.939884	+0.01807 5.8913	+0.000167 0.2226	+0.0347 3.5817
A SEP. 2 (OH)	Y:	+0.0691	-0.00002	+32.1386 4.486152	+0.02140 1.0714	+0.000153 2.0849	+0.0349 5.1292
SEP. 1 (OH) (2447405.5)	X:	-0.0768	+0.00009	+31.3051 0.181090	+0.02739 3.3574	+0.000069 4.5268	+0.0340 4.3291
A OCT. 3 (OH)	Y:	+0.0679	-0.00006	+31.3945 1.728668	+0.02770 4.8958	+0.000099 0.2886	+0.0341 5.8770
OCT. 1 (OH) (2447435.5)	X:	-0.0740	+0.00005	+30.4642 2.979710	+0.02942 0.0098	+0.000085 2.4727	+0.0329 3.6482
A NOV. 2 (OH)	Y:	+0.0661	-0.00005	+30.5778 4.526588	+0.02772 1.6325	+0.000131 3.9841	+0.0331 5.1939
NOV. 1 (OH) (2447466.5)	X:	-0.0725	+0.00004	+29.6397 0.213073	+0.02552 3.6657	+0.000143 0.0931	+0.0323 4.3934
A DEC. 3 (OH)	Y:	+0.0643	-0.00005	+29.8558 1.757355	+0.02267 5.4189	+0.000180 1.5949	+0.0326 5.9371
DEC. 1 (OH) (2447496.5)	X:	-0.0711	+0.00001	+29.0404 3.005941	+0.01810 0.3859	+0.000178 3.0631	+0.0317 3.7045
A DEC.33 (OH)	Y:	+0.0625	-0.00002	+29.4283 4.546465	+0.01581 2.3940	+0.000202 4.6016	+0.0322 5.2421

1988 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 4 D'URANUS: OBERON N=0.4667

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
JAN. 1 (OH)	X:	-0.0051	-0.00001	+39.2385	+0.01194	+0.000257	+0.0157
(2447161.5)				0.775208	5.4394	0.9595	4.8006
A FEV. 2 (OH)	Y:	+0.0470	+0.00001	+39.4151	+0.01933	+0.000260	+0.0156
				2.321661	1.1383	2.5579	0.0649
FEV. 1 (OH)	X:	-0.0058	+0.00001	+39.4630	+0.01786	+0.000224	+0.0160
(2447192.5)				2.668325	2.1493	2.9955	2.3115
A MAR. 4 (OH)	Y:	+0.0465	+0.00008	+39.8853	+0.02718	+0.000208	+0.0161
				4.210612	3.6769	4.7496	3.8559
MAR. 1 (OH)	X:	-0.0069	+0.00006	+40.0892	+0.02884	+0.000154	+0.0162
(2447221.5)				3.631388	3.4690	4.2716	4.2457
A AVR. 2 (OH)	Y:	+0.0482	+0.00004	+40.7111	+0.03503	+0.000131	+0.0167
				5.170872	4.9626	0.0752	5.7785
AVR. 1 (OH)	X:	-0.0053	-0.00004	+41.0824	+0.03667	+0.000091	+0.0164
(2447252.5)				5.531286	5.5643	1.3886	1.7565
A MAI 3 (OH)	Y:	+0.0508	-0.00002	+41.8158	+0.03749	+0.000172	+0.0171
				0.786481	0.8014	3.1167	3.2968
MAI 1 (OH)	X:	-0.0048	-0.00006	+42.1345	+0.03460	+0.000230	+0.0170
(2447282.5)				0.685229	0.8540	3.6122	4.6248
A JUN. 2 (OH)	Y:	+0.0502	+0.00007	+42.8276	+0.03159	+0.000291	+0.0172
				2.224060	2.4884	5.1136	6.1836
JUN. 1 (OH)	X:	-0.0064	+0.00005	+42.9706	+0.02158	+0.000357	+0.0173
(2447313.5)				2.591788	3.0082	5.7639	2.1554
A JUL. 3 (OH)	Y:	+0.0520	-0.00001	+43.5022	+0.01816	+0.000349	+0.0174
				4.132795	4.9308	1.0210	3.7083
JUL. 1 (OH)	X:	-0.0047	-0.00002	+43.2432	+0.00846	+0.000348	+0.0173
(2447343.5)				4.032187	5.8669	1.0786	5.0264
A AOU. 2 (OH)	Y:	+0.0520	-0.00001	+43.5727	+0.01529	+0.000308	+0.0172
				5.576145	1.4782	2.7061	0.3025
AOU. 1 (OH)	X:	-0.0058	+0.00007	+42.8539	+0.02435	+0.000217	+0.0171
(2447374.5)				5.937968	2.6237	3.2125	2.5434
A SEP. 2 (OH)	Y:	+0.0502	+0.00002	+43.0191	+0.02841	+0.000204	+0.0170
				1.201391	4.0821	5.0364	4.1082
SEP. 1 (OH)	X:	-0.0050	+0.00003	+41.9235	+0.03651	+0.000088	+0.0167
(2447405.5)				1.557226	4.7379	5.8205	0.0540
A OCT. 3 (OH)	Y:	+0.0512	-0.00011	+42.0257	+0.03729	+0.000135	+0.0165
				3.105116	6.2677	1.7026	1.6124
OCT. 1 (OH)	X:	-0.0036	-0.00004	+40.8000	+0.03941	+0.000121	+0.0161
(2447435.5)				2.989051	0.0120	2.4337	2.9304
A NOV. 2 (OH)	Y:	+0.0490	-0.00004	+40.9306	+0.03707	+0.000176	+0.0161
				4.536316	1.6395	3.9813	4.4615
NOV. 1 (OH)	X:	-0.0045	+0.00000	+39.6969	+0.03410	+0.000191	+0.0157
(2447466.5)				4.883857	2.0599	4.7410	0.4407
A DEC. 3 (OH)	Y:	+0.0470	+0.00001	+39.9641	+0.03036	+0.000243	+0.0158
				0.145274	3.8065	6.2230	1.9729
DEC. 1 (OH)	X:	-0.0050	+0.00001	+38.8982	+0.02438	+0.000238	+0.0154
(2447496.5)				0.026460	3.7091	0.0339	3.2912
A DEC.33 (OH)	Y:	+0.0471	-0.00001	+39.3919	+0.02171	+0.000272	+0.0158
				1.567338	5.7099	1.5839	4.8286

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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 1988 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 1988.

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 1988 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.

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