Ephémérides des satellites de Jupiter, Saturne et Uranus pour 1990

Th. Derouazi, Ch. Ruatti, W Thuillot, D.T. Vu

SUPPLEMENT A LA CONNAISSANCE DES TEMPS - PARIS 1989
BUREAU DES LONGITUDES

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Other supplements to the Connaissance des Temps :

• *Ephemerides of the Faint Satellites of Jupiter (VI, VII, VIII, IX) and of Saturn (IX) for 1990*

• *Phenomena and configurations of the Galilean Satellites of Jupiter for 1990*

• *Configurations of the First Eight Satellites of Saturn for 1990*

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• Annuaire du Bureau des Longitudes, Ephémérides pour 1990 (Masson, Paris)
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• Encyclopédie Scientifique de l'Univers (Bordas, Paris) :
  La physique (1981)
  La terre, les eaux, l'atmosphère (réédition, 1984)
  Les étoiles, le système solaire (réédition, 1985)
  La galaxie, l'univers extra-galactique (réédition, 1988)

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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TABLE DES MATIERES

TABLE OF CONTENTS

PRÉSENTATION DES ÉPHÉMÉRIDES
PRESENTATION OF THE EPHEMERIDES

CONTENU

On trouve dans cette publication :

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

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

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

Les éphémérides des satellites donnent les coordonnées différentielles 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, à l'équateur 1950.0 pour les satellites de Saturne et à l'équateur J2000 pour ceux d'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 de Laskar et Jacobson (1987).

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, equator J2000 for the satellites of 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 Laskar and Jacobson (1987).

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 31 jours pour Ariel ;

— 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 (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 31 days (in the case of Ariel) ;

— 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 (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 :

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

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 1980 et le 1 juillet 1988) 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 1980 January 1 to 1988 July 1) between TDT and UTC (using the relationship between TAI and UTC published by BIH).

	TDT-UTC
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 - 1988 Juil. 1	55.184 s
1988 Juil. 1 -	56.184 s

Pour 1990, 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 1990 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 1990 à 23 h 30 min UTC.

On effectue d'abord une correction pour se ramener à l'échelle TDB. Pour 1990 nous avons choisi 57 secondes ; la date T est donc le 5 janvier 1990 à 23 h 30 min 57 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 1990 January 5, 23 h 30 min UTC.

First, the date must be corrected in order to fit with the TDB time-scale. For 1990, we choose 57 seconds ; so, the date T us 1990 January 5, 23 h 30 min 57 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 :

$$A0 = 0.,\quad A1 = 0.,\quad B0 = 36.704\,2,\quad B1 = 0.072\,08,\quad B2 = 0.000\,385,\quad C0 = 0.003\,0$$
$$F0 = 1.635\,128,\quad F1 = 6.278\,1,\quad F2 = 1.912\,0,\quad P0 = 0.051\,3$$

et pour Y : *and for Y :*

$$A0 = -0.001\,1,\quad A1 = 0.,\quad B0 = 15.336\,6,\quad B1 = 0.031\,02,\quad B2 = 0.000\,153,\quad C0 = 0.001\,2$$
$$F0 = 3.449\,693,\quad F1 = 1.271\,7,\quad F2 = 3.922\,7,\quad P0 = 1.867\,8$$

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 57 s, soit 4,979 826 jours.

On obtient finalement :

$$X = -22{,}24''$$
$$Y = +14{,}12''$$

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 57 s. Hence t = 4.979 826 days.

Finally, we get :

$$X = -22.24''$$
$$Y = +14.12''$$

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.

REFERENCES

ARLOT, J.-E. : 1982, *Astron. Astrophys.* **107,** 305.
CHAPRONT, J., VU, D.T. : 1984, *Astron. Astrophys.* **141,** 131.
KOZAÏ, Y. : 1959, *Astron. J.* **64,** 367.
LASKAR, J., JACOBSON, R.A. : 1987, *Astron. Astrophys.* **188,** 212.
LIESKE, J.H. : 1977, *Astron. Astrophys.* **56,** 333.
RAPAPORT, M. : 1977, Thèse d'Etat, Université de Bordeaux I.
SAMPSON, R.A. : 1921, *Mem. Roy. Astron. Soc.* **63**.
STRUVE, G. : 1930, *Veröff. Univ. Sternw. Berlin Babelsberg* **6**.
THUILLOT, W. : 1983, *Astron. Astrophys.* **127,** 63.

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

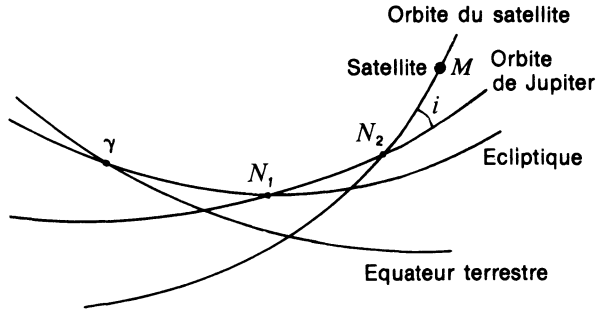
SATELLITES OF JUPITER

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 1990.5 (minutes et secondes de degré)				
Sampson (1921) :	2′06″	26′28″	10′41″	21′25″
Valeur moyenne de l'excentricité pour 1990.5				
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° + 203.488992435 τ	1.7691374639
Europe	99.55081° + 101.374761672 τ	3.5511797420
Ganymède	168.02628° + 50.317646290 τ	7.1545476894
Callisto	234.40790° + 21.571109630 τ	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 × 85 × 75	(S)	0.05	14.1	0.498 179	59	181	0.003	0.40
VI Himalia	$50. \times 10^{-10}$	90	0.4	0.03	14.84	250.566 2	1 02 46	11 480	0.158	27.63 (1) (2)
VII Elara	$4. \times 10^{-10}$	40	0.5	0.03	16.77	259.652 8	1 04 10	11 737	0.207	24.77 (1) (2)
VIII Pasiphae	$1. \times 10^{-10}$				17.0	735. (R)	2 08 26	23 500	0.378	145. (1) (2)
IX Sinope	0.4×10^{-10}	15			18.3	758. (R)	2 09 31	23 700	0.275	153. (1) (2)
X Lysithea	0.4×10^{-10}	10			18.4	259.22	1 04 04	11 720	0.107	29.02 (2)
XI Carme	0.5×10^{-10}	15			18.0	692. (R)	2 03 31	22 600	0.207	164. (2)
XII Ananke	0.2×10^{-10}	10			18.9	631. (R)	1 55 52	21 200	0.169	147. (2)
XIII Leda	0.03×10^{-10}	8			20.	238.72	1 00 39	11 094	0.148	26.07 (2)
XIV Thebe	$4. \times 10^{-10}$	40		0.05	16.0	0.674 55	1 13	221		
XV Adrastea	0.1×10^{-10}	10		0.05	18.9	0.298	42	129		
XVI Metis	0.5×10^{-10}	20		0.05	17.5	0.294 79	42	128		
NAME	*mass*	*radius*	*sidereal rotation*	*geometrical albedo*	*visual magnitude*	*orbital period*	*greatest elongation*	*semi major axis*	*eccentricity*	*inclination on Jupiter's equator*
unit →	*Jupiter's mass*	*km*	*day*			*day*	*(°) (') (")*	*10^3 km*		*degree*

NOTES

(S) : révolution synchrone
(R) : révolution rétrograde
(1) : les éphémérides des satellites VI, VII, VIII et IX sont données sous forme de coefficients de Tchébycheff dans le supplément à la Connaissance des Temps « Satellites faibles... »
(2) : inclinaison sur l'orbite de Jupiter

(S) : synchronous revolution
(R) : retrograde revolution
(1) : the ephemerides for satellites VI, VII, VIII and IX are given as Chebychev coefficients in the Supplément à la Connaissance des Temps « Faint Satellites... »
(2) : inclination on Jupiter's orbit

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

Data from the Encyclopédie du Bureau des Longitudes.

ÉPHÉMÉRIDES DES SATELLITES GALILÉENS

EPHEMERIDES OF THE GALILEAN SATELLITES

Coordonnées différentielles 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)*	

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 1 DE JUPITER: IO N=3.5516

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
JAN. 1 (0H)	X:	-0.6290	-0.00661	+139.1986	+0.30819	+0.007419	+0.3210
(2447892.5)				1.301762	3.0134	4.5004	0.1957
A JAN. 5 (0H)	Y:	+0.0566	-0.00075	+ 9.4979	+0.14514		+0.0214
				3.866324	1.1665		2.7411
JAN. 5 (0H)	X:	-0.6477	-0.00914	+138.9199	+0.30689	+0.006264	+0.3188
(2447896.5)				2.950575	4.8337	6.2165	3.5369
A JAN. 9 (0H)	Y:	+0.0535	-0.00047	+ 8.9764	+0.14304		+0.0201
				5.478724	2.8150		6.0367
JAN. 9 (0H)	X:	-0.6723	-0.00639	+138.4592	+0.30029	+0.005452	+0.3153
(2447900.5)				4.599064	0.3574	1.2177	0.5854
A JAN.13 (0H)	Y:	+0.0510	-0.00064	+ 8.4724	+0.13889		+0.0186
				0.804537	4.4607		3.0403
JAN.13 (0H)	X:	-0.6970	-0.00459	+137.8429	+0.30582	+0.004051	+0.3144
(2447904.5)				6.247033	2.1655	2.4001	3.9205
A JAN.17 (0H)	Y:	+0.0473	-0.00057	+ 7.9929	+0.13212		+0.0176
				2.410281	6.1008		0.0852
JAN.17 (0H)	X:	-0.7137	-0.00254	+137.0734	+0.33262	+0.005780	+0.3085
(2447908.5)				1.611125	3.8825	5.6516	0.9716
A JAN.21 (0H)	Y:	+0.0444	-0.00087	+ 7.5473	+0.12484		+0.0169
				4.013591	1.4586		3.3674
JAN.21 (0H)	X:	-0.7359	+0.00064	+136.1584	+0.33944	+0.008231	+0.3055
(2447912.5)				3.257953	5.6325	1.2130	4.3045
A JAN.25 (0H)	Y:	+0.0422	-0.00099	+ 7.1361	+0.11460		+0.0157
				5.614790	3.0951		0.3247
JAN.25 (0H)	X:	-0.7384	-0.00277	+135.1184	+0.34481	+0.008768	+0.2997
(2447916.5)				4.904072	1.1134	2.9804	1.3555
A JAN.29 (0H)	Y:	+0.0384	-0.00078	+ 6.7685	+0.10452		+0.0142
				0.932086	4.7254		3.6244
JAN.29 (0H)	X:	-0.7540	+0.00006	+133.9611	+0.34037	+0.008445	+0.2957
(2447920.5)				0.266236	2.8769	4.3461	4.6874
A FEV. 2 (0H)	Y:	+0.0347	-0.00091	+ 6.4406	+0.09209		+0.0140
				2.532804	0.0674		0.6845
FEV. 1 (0H)	X:	-0.7563	-0.00156	+133.0334	+0.35671	+0.008550	+0.2917
(2447923.5)				4.641223	1.0473	2.8373	0.9022
A FEV. 5 (0H)	Y:	+0.0330	-0.00073	+ 6.2244	+0.08340		+0.0131
				0.592979	4.4210		3.0856
FEV. 5 (0H)	X:	-0.7683	+0.00151	+131.7100	+0.35545	+0.008139	+0.2866
(2447927.5)				0.001866	2.7992	4.2962	4.2332
A FEV. 9 (0H)	Y:	+0.0294	-0.00079	+ 5.9694	+0.06994		+0.0127
				2.197670	6.0216		0.1756
FEV. 9 (0H)	X:	-0.7617	-0.00427	+130.3203	+0.36151	+0.003012	+0.2815
(2447931.5)				1.644879	4.6003	5.5355	1.2852
A FEV.13 (0H)	Y:	+0.0265	-0.00070	+ 5.7552	+0.05818		+0.0128
				3.807064	1.3234		3.4750
FEV.13 (0H)	X:	-0.7684	-0.00111	+128.8691	+0.37390	+0.001147	+0.2764
(2447935.5)				3.286843	0.0658	0.4640	4.6138
A FEV.17 (0H)	Y:	+0.0251	-0.00065	+ 5.5728	+0.04475		+0.0120
				5.421693	2.8727		0.4033
FEV.17 (0H)	X:	-0.7695	-0.00200	+127.3628	+0.37861	+0.001944	+0.2723
(2447939.5)				4.927813	1.7957	1.1684	1.6636
A FEV.21 (0H)	Y:	+0.0219	-0.00023	+ 5.4257	+0.03398		+0.0109
				0.760065	4.3567		3.7313

1990 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:	-0.7688	+0.00044	+125.8316	+0.39291	+0.002377	+0.2660
(2447943.5)				0.284521	3.4679	5.3062	4.9884
A FEV.25 (OH)	Y:	+0.0192	-0.00029	+ 5.3038	+0.02298		+0.0112
				2.388839	5.6909		0.8561
FEV.25 (OH)	X:	-0.7738	+0.00405	+124.2716	+0.39509	+0.007726	+0.2628
(2447947.5)				1.923473	5.1275	0.3841	2.0361
A FEV.29 (OH)	Y:	+0.0182	-0.00035	+ 5.2131	+0.01809		+0.0116
				4.025901	0.5180		4.1536
MAR. 1 (OH)	X:	-0.7621	+0.00296	+122.6986	+0.39927	+0.006290	+0.2557
(2447951.5)				3.561691	0.5781	2.1031	5.3631
A MAR. 5 (OH)	Y:	+0.0177	-0.00036	+ 5.1455	+0.01923		+0.0106
				5.671038	1.4736		1.1582
MAR. 5 (OH)	X:	-0.7592	+0.00615	+121.1253	+0.40113	+0.005576	+0.2510
(2447955.5)				5.198884	2.2913	3.7437	2.4018
A MAR. 9 (OH)	Y:	+0.0162	-0.00019	+ 5.1078	+0.02620		+0.0100
				1.040998	2.7420		4.5455
MAR. 9 (OH)	X:	-0.7400	+0.00222	+119.5624	+0.39922	+0.004488	+0.2454
(2447959.5)				0.551956	4.0043	4.8835	5.7372
A MAR.13 (OH)	Y:	+0.0147	-0.00019	+ 5.0951	+0.03472		+0.0107
				2.701588	4.1488		1.6448
MAR.13 (OH)	X:	-0.7277	+0.00324	+118.0292	+0.42128	+0.001149	+0.2397
(2447963.5)				2.187475	5.7370	3.1224	2.7758
A MAR.17 (OH)	Y:	+0.0148	-0.00022	+ 5.1142	+0.04340		+0.0111
				4.368641	5.6842		4.9524
MAR.17 (OH)	X:	-0.7114	+0.00125	+116.5019	+0.42297	+0.001743	+0.2357
(2447967.5)				3.821968	1.1459	4.9851	6.1064
A MAR.21 (OH)	Y:	+0.0147	+0.00006	+ 5.1613	+0.05184		+0.0103
				6.041382	0.9388		2.0410
MAR.21 (OH)	X:	-0.6960	+0.00322	+115.0030	+0.41827	+0.000669	+0.2305
(2447971.5)				5.455534	2.8098	5.3180	3.1436
A MAR.25 (OH)	Y:	+0.0140	+0.00015	+ 5.2435	+0.06010		+0.0103
				1.434768	2.5267		5.4715
MAR.25 (OH)	X:	-0.6827	+0.00450	+113.5528	+0.42525	+0.004608	+0.2261
(2447975.5)				0.805163	4.4532	0.1643	0.1863
A MAR.29 (OH)	Y:	+0.0136	+0.00023	+ 5.3586	+0.06768		+0.0112
				3.114563	4.1060		2.5238
MAR.29 (OH)	X:	-0.6631	+0.00680	+112.1182	+0.41269	+0.004540	+0.2208
(2447979.5)				2.437300	6.1390	1.0163	3.5096
A AVR. 2 (OH)	Y:	+0.0145	-0.00003	+ 5.5115	+0.07432		+0.0112
				4.795623	5.7075		5.8584
AVR. 1 (OH)	X:	-0.6448	+0.00444	+111.0859	+0.42766	+0.003779	+0.2185
(2447982.5)				0.519360	4.2605	0.1857	6.0041
A AVR. 5 (OH)	Y:	+0.0140	+0.00031	+ 5.6481	+0.07960		+0.0117
				2.914990	3.7596		2.1429
AVR. 5 (OH)	X:	-0.6236	+0.00755	+109.7275	+0.41298	+0.004413	+0.2137
(2447986.5)				2.150224	5.9305	0.7806	3.0437
A AVR. 9 (OH)	Y:	+0.0149	+0.00000	+ 5.8645	+0.08491		+0.0118
				4.595521	5.3644		5.4894

1990 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:	-0.6026	+0.00863	+108.4157	+0.40813	+0.004831	+0.2095
(2447990.5)				3.780517	1.3316	2.1935	0.0811
A AVR.13 (OH)	Y:	+0.0159	+0.00000	+ 6.1131	+0.09065		+0.0119
				6.274264	0.6782		2.6177
AVR.13 (OH)	X:	-0.5710	+0.00844	+107.1616	+0.41486	+0.003616	+0.2050
(2447994.5)				5.410205	3.0061	4.1829	3.4110
A AVR.17 (OH)	Y:	+0.0159	-0.00003	+ 6.3971	+0.09540		+0.0127
				1.667152	2.2851		5.9975
AVR.17 (OH)	X:	-0.5454	+0.00902	+105.9516	+0.42223	+0.000908	+0.2020
(2447998.5)				0.756193	4.7073	2.9608	0.4473
A AVR.21 (OH)	Y:	+0.0160	-0.00010	+ 6.7117	+0.10001		+0.0134
				3.340229	3.8900		3.0424
AVR.21 (OH)	X:	-0.5063	+0.00540	+104.7972	+0.43424	+0.003360	+0.1984
(2448002.5)				2.384792	0.0891	3.5092	3.7798
A AVR.25 (OH)	Y:	+0.0156	+0.00002	+ 7.0565	+0.10390		+0.0137
				5.009938	5.4979		0.1204
AVR.25 (OH)	X:	-0.4800	+0.00768	+103.6825	+0.42717	+0.002670	+0.1948
(2448006.5)				4.012723	1.7386	4.6800	0.8143
A AVR.29 (OH)	Y:	+0.0162	-0.00011	+ 7.4268	+0.10814		+0.0143
				0.393100	0.8160		3.5095
AVR.29 (OH)	X:	-0.4429	+0.00488	+102.6155	+0.41877	+0.001666	+0.1930
(2448010.5)				5.640218	3.4027	0.3044	4.1414
A MAI 3 (OH)	Y:	+0.0149	+0.00019	+ 7.8230	+0.11178		+0.0154
				2.055773	2.4276		0.5825
MAI 1 (OH)	X:	-0.4380	+0.01097	+102.1047	+0.41540	+0.000330	+0.1906
(2448012.5)				0.170704	4.2360	4.8454	5.8019
A MAI 5 (OH)	Y:	+0.0156	-0.00035	+ 8.0296	+0.11333		+0.0156
				2.886068	3.2266		2.2379
MAI 5 (OH)	X:	-0.3931	+0.00710	+101.1197	+0.42814	+0.003553	+0.1874
(2448016.5)				1.797764	5.9132	3.2128	2.8483
A MAI 9 (OH)	Y:	+0.0140	-0.00020	+ 8.4587	+0.11604		+0.0161
				4.544066	4.8315		5.6007
MAI 9 (OH)	X:	-0.3633	+0.00917	+100.1829	+0.42386	+0.003443	+0.1850
(2448020.5)				3.424238	1.2740	4.4097	6.1668
A MAI 13 (OH)	Y:	+0.0137	-0.00043	+ 8.9053	+0.11932		+0.0168
				6.198927	0.1547		2.6837
MAI 13 (OH)	X:	-0.3201	+0.00561	+ 99.2915	+0.40996	+0.001313	+0.1833
(2448024.5)				5.050317	2.9261	5.9831	3.2105
A MAI 17 (OH)	Y:	+0.0115	-0.00009	+ 9.3698	+0.12186		+0.0179
				1.567770	1.7623		6.0274
MAI 17 (OH)	X:	-0.2890	+0.00877	+ 98.4561	+0.40442	+0.001968	+0.1800
(2448028.5)				0.392987	4.5659	0.1049	0.2488
A MAI 21 (OH)	Y:	+0.0100	-0.00040	+ 9.8485	+0.12471		+0.0186
				3.217243	3.3703		3.0659
MAI 21 (OH)	X:	-0.2542	+0.00914	+ 97.6607	+0.38685	+0.004986	+0.1791
(2448032.5)				2.018499	6.2132	0.6725	3.5676
A MAI 25 (OH)	Y:	+0.0075	-0.00050	+ 10.3421	+0.12666		+0.0193
				4.864532	4.9706		0.1493
MAI 25 (OH)	X:	-0.2172	+0.01094	+ 96.9154	+0.39149	+0.002801	+0.1757
(2448036.5)				3.643941	1.6082	2.1468	0.6125
A MAI 29 (OH)	Y:	+0.0058	-0.00096	+ 10.8456	+0.12958		+0.0205
				0.226404	0.2928		3.5056

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 1 DE JUPITER: IO N=3.5516

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
MAI 29 (OH)	X:	-0.1830	+0.01246	+ 96.2265	+0.40278	+0.001044	+0.1742
(2448040.5)				5.269154	3.2693	5.7604	3.9318
A JUN. 2 (OH)	Y:	+0.0033	-0.00114	+ 11.3622	+0.13145		+0.0213
				1.869555	1.8977		0.5367
JUN. 1 (OH)	X:	-0.1496	+0.01093	+ 95.7318	+0.38602	+0.002865	+0.1731
(2448043.5)				3.346128	1.3625	1.8584	0.1477
A JUN. 5 (OH)	Y:	+0.0001	-0.00115	+ 11.7547	+0.13315		+0.0220
				6.242286	6.2463		3.0708
JUN. 5 (OH)	X:	-0.1144	+0.01207	+ 95.1230	+0.39696	+0.000771	+0.1725
(2448047.5)				4.971008	3.0282	6.0904	3.4656
A JUN. 9 (OH)	Y:	-0.0030	-0.00131	+ 12.2867	+0.13508		+0.0230
				1.599389	1.5671		0.0964
JUN. 9 (OH)	X:	-0.0711	+0.01101	+ 94.5586	+0.39177	+0.001115	+0.1715
(2448051.5)				0.312394	4.6865	3.0029	0.5141
A JUN.13 (OH)	Y:	-0.0076	-0.00138	+ 12.8266	+0.13660		+0.0237
				3.238109	3.1770		3.4400
JUN.13 (OH)	X:	-0.0328	+0.01071	+ 94.0437	+0.40130	+0.003422	+0.1696
(2448055.5)				1.936938	0.0502	3.3793	3.8361
A JUN.17 (OH)	Y:	-0.0125	-0.00143	+ 13.3733	+0.13829		+0.0246
				4.875686	4.7824		0.4981
JUN.17 (OH)	X:	+0.0122	+0.00793	+ 93.5731	+0.39864	+0.004237	+0.1704
(2448059.5)				3.561245	1.6862	4.5749	0.8787
A JUN.21 (OH)	Y:	-0.0182	-0.00121	+ 13.9249	+0.14063		+0.0260
				0.228869	0.1091		3.8403
JUN.21 (OH)	X:	+0.0483	+0.00834	+ 93.1393	+0.37825	+0.000863	+0.1688
(2448063.5)				5.185346	3.3414	5.2913	4.2017
A JUN.25 (OH)	Y:	-0.0235	-0.00131	+ 14.4834	+0.14233		+0.0269
				1.864171	1.7207		0.8789
JUN.25 (OH)	X:	+0.0884	+0.00672	+ 92.7586	+0.37058	+0.002653	+0.1690
(2448067.5)				0.526337	4.9801	6.0910	1.2414
A JUN.29 (OH)	Y:	-0.0302	-0.00102	+ 15.0466	+0.14436		+0.0276
				3.498665	3.3307		4.2106
JUN.29 (OH)	X:	+0.1192	+0.00990	+ 92.4157	+0.36281	+0.003167	+0.1675
(2448071.5)				2.150483	0.3632	0.8092	4.5647
A JUL. 3 (OH)	Y:	-0.0358	-0.00174	+ 15.6163	+0.14567		+0.0289
				5.132459	4.9339		1.2778
JUL. 1 (OH)	X:	+0.1425	+0.00838	+ 92.2691	+0.39116	+0.004874	+0.1690
(2448073.5)				2.962759	1.1936	4.2317	6.2320
A JUL. 5 (OH)	Y:	-0.0391	-0.00164	+ 15.9016	+0.14665		+0.0296
				5.949019	5.7419		2.9409
JUL. 5 (OH)	X:	+0.1774	+0.00802	+ 91.9964	+0.36805	+0.001349	+0.1680
(2448077.5)				4.586686	2.8391	4.7852	3.2690
A JUL. 9 (OH)	Y:	-0.0456	-0.00165	+ 16.4762	+0.14840		+0.0308
				1.298459	1.0723		6.2623
JUL. 9 (OH)	X:	+0.2173	+0.00530	+ 91.7675	+0.36069	+0.001304	+0.1690
(2448081.5)				6.210811	4.4956	5.4661	0.3054
A JUL.13 (OH)	Y:	-0.0537	-0.00116	+ 17.0548	+0.14984		+0.0318
				2.930541	2.6867		3.3050
JUL.13 (OH)	X:	+0.2440	+0.00864	+ 91.5860	+0.35263	+0.003165	+0.1684
(2448085.5)				1.551786	6.1447	0.3861	3.6290
A JUL.17 (OH)	Y:	-0.0603	-0.00185	+ 17.6375	+0.15184		+0.0330
				4.562311	4.2911		0.3737

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 1 DE JUPITER: IO N=3.5516

		AO	A1	BO FO	B1 F1	B2 F2	CO PO
JUL.17 (OH)	X:	+0.2785	+0.00696	+ 91.4414	+0.35095	+0.002957	+0.1686
(2448089.5)				3.176036	1.5379	1.4935	0.6670
A JUL.21 (OH)	Y:	-0.0679	-0.00170	+ 18.2226	+0.15375		+0.0346
				6.193473	5.9065		3.6914
JUL.21 (OH)	X:	+0.3059	+0.01021	+ 91.3507	+0.36182	+0.000663	+0.1696
(2448093.5)				4.800424	3.1871	5.7601	3.9949
A JUL.25 (OH)	Y:	-0.0741	-0.00248	+ 18.8123	+0.15556		+0.0355
				1.541148	1.2371		0.7332
JUL.25 (OH)	X:	+0.3367	+0.00861	+ 91.3068	+0.36558	+0.002364	+0.1703
(2448097.5)				0.141652	4.8357	1.5546	1.0312
A JUL.29 (OH)	Y:	-0.0819	-0.00221	+ 19.4069	+0.15627		+0.0367
				3.171640	2.8532		4.0638
JUL.29 (OH)	X:	+0.3705	+0.00762	+ 91.3023	+0.37056	+0.004516	+0.1720
(2448101.5)				1.766193	0.2097	3.2933	4.3596
A AOU. 2 (OH)	Y:	-0.0905	-0.00215	+ 20.0031	+0.15780		+0.0382
				4.801919	4.4703		1.1110
AOU. 1 (OH)	X:	+0.3863	+0.00798	+ 91.3318	+0.36013	+0.002352	+0.1721
(2448104.5)				6.126186	4.5887	1.1573	0.5627
A AOU. 5 (OH)	Y:	-0.0955	-0.00222	+ 20.4528	+0.15888		+0.0391
				2.882905	2.5415		3.6053
AOU. 5 (OH)	X:	+0.4171	+0.00727	+ 91.4046	+0.36516	+0.004296	+0.1741
(2448108.5)				1.467799	6.2513	3.0291	3.8917
A AOU. 9 (OH)	Y:	-0.1040	-0.00222	+ 21.0543	+0.16037		+0.0407
				4.512873	4.1607		0.6519
AOU. 9 (OH)	X:	+0.4400	+0.00642	+ 91.5261	+0.35320	+0.003100	+0.1754
(2448112.5)				3.092598	1.6182	4.1815	0.9236
A AOU.13 (OH)	Y:	-0.1113	-0.00205	+ 21.6581	+0.16234		+0.0420
				6.142674	5.7852		3.9771
AOU.13 (OH)	X:	+0.4710	+0.00299	+ 91.6958	+0.33246	+0.002268	+0.1776
(2448116.5)				4.717530	3.2776	4.1310	4.2477
A AOU.17 (OH)	Y:	-0.1205	-0.00133	+ 22.2672	+0.16337		+0.0436
				1.489213	1.1256		1.0149
AOU.17 (OH)	X:	+0.4871	+0.00396	+ 91.9071	+0.33341	+0.001545	+0.1779
(2448120.5)				0.059723	4.9483	5.6501	1.2860
A AOU.21 (OH)	Y:	-0.1269	-0.00147	+ 22.8790	+0.16469		+0.0445
				3.118976	2.7485		4.3473
AOU.21 (OH)	X:	+0.5097	+0.00201	+ 92.1666	+0.32809	+0.002699	+0.1803
(2448124.5)				1.685276	0.3352	0.5678	4.6032
A AOU.25 (OH)	Y:	-0.1354	-0.00101	+ 23.4944	+0.16666		+0.0468
				4.748841	4.3656		1.3907
AOU.25 (OH)	X:	+0.5211	+0.00440	+ 92.4740	+0.32972	+0.001938	+0.1818
(2448128.5)				3.311115	2.0113	1.7532	1.6485
A AOU.29 (OH)	Y:	-0.1402	-0.00173	+ 24.1126	+0.16789		+0.0482
				0.095429	5.9939		4.7125
AOU.29 (OH)	X:	+0.5357	+0.00393	+ 92.8381	+0.34535	+0.003057	+0.1836
(2448132.5)				4.937379	3.6487	0.0087	4.9636
A SEP. 2 (OH)	Y:	-0.1464	-0.00157	+ 24.7359	+0.16855		+0.0495
				1.725354	1.3373		1.7544
SEP. 1 (OH)	X:	+0.5469	+0.00314	+ 93.1335	+0.32525	+0.002205	+0.1853
(2448135.5)				3.015395	1.7842	1.6701	1.1753
A SEP. 5 (OH)	Y:	-0.1511	-0.00143	+ 25.2037	+0.16970		+0.0510
				6.089438	5.7009		4.2481

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 1 DE JUPITER: IO N=3.5516

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
SEP. 5 (OH) (2448139.5)	X:	+0.5588	+0.00270	+ 93.5800 4.642208	+0.34181 3.4306	+0.002951 6.1352	+0.1878 4.4914
A SEP. 9 (OH)	Y:	-0.1567	-0.00126	+ 25.8323 1.436408	+0.17022 1.0485		+0.0524 1.2893
SEP. 9 (OH) (2448143.5)	X:	+0.5652	+0.00452	+ 94.0780 6.269183	+0.33724 5.0903	+0.002921 1.2565	+0.1912 1.5357
A SEP.13 (OH)	Y:	-0.1604	-0.00187	+ 26.4651 3.066743	+0.17043 2.6782		+0.0544 4.6163
SEP.13 (OH) (2448147.5)	X:	+0.5753	+0.00240	+ 94.6198 1.613333	+0.33380 0.4808	+0.003032 2.7839	+0.1932 4.8529
A SEP.17 (OH)	Y:	-0.1654	-0.00125	+ 27.0988 4.697251	+0.17122 4.3158		+0.0556 1.6538
SEP.17 (OH) (2448151.5)	X:	+0.5829	+0.00201	+ 95.2182 3.241083	+0.32910 2.1412	+0.004312 4.1079	+0.1971 1.8888
A SEP.21 (OH)	Y:	-0.1695	-0.00116	+ 27.7359 0.044857	+0.17206 5.9554		+0.0579 4.9808
SEP.21 (OH) (2448155.5)	X:	+0.5878	-0.00049	+ 95.8633 4.869176	+0.31505 3.8544	+0.001875 4.3440	+0.1994 5.2145
A SEP.25 (OH)	Y:	-0.1733	-0.00040	+ 28.3776 1.675947	+0.17180 1.3095		+0.0593 2.0213
SEP.25 (OH) (2448159.5)	X:	+0.5938	-0.00214	+ 96.5567 0.214683	+0.31394 5.5544	+0.002724 5.2143	+0.2029 2.2470
A SEP.29 (OH)	Y:	-0.1773	+0.00018	+ 29.0196 3.307423	+0.17242 2.9474		+0.0612 5.3477
SEP.29 (OH) (2448163.5)	X:	+0.5875	-0.00146	+ 97.3082 1.843907	+0.31703 0.9390	+0.002031 1.0014	+0.2052 5.5728
A OCT. 3 (OH)	Y:	-0.1781	+0.00001	+ 29.6650 4.939295	+0.17266 4.5840		+0.0632 2.3856
OCT. 1 (OH) (2448165.5)	X:	+0.5831	+0.00137	+ 97.7055 2.658762	+0.33005 1.7402	+0.004544 3.8863	+0.2086 0.9478
A OCT. 5 (OH)	Y:	-0.1768	-0.00090	+ 29.9878 5.755263	+0.17204 5.4139		+0.0642 4.0479
OCT. 5 (OH) (2448169.5)	X:	+0.5825	-0.00182	+ 98.5385 4.288586	+0.31351 3.4490	+0.002423 4.3175	+0.2103 4.2718
A OCT. 9 (OH)	Y:	-0.1789	+0.00010	+ 30.6363 1.104459	+0.17092 0.7767		+0.0658 1.0869
OCT. 9 (OH) (2448173.5)	X:	+0.5815	-0.00359	+ 99.4118 5.919074	+0.31271 5.1737	+0.002893 4.6297	+0.2146 1.3058
A OCT.13 (OH)	Y:	-0.1800	+0.00071	+ 31.2841 2.737346	+0.17013 2.4206		+0.0677 4.4119
OCT.13 (OH) (2448177.5)	X:	+0.5693	-0.00346	+100.3457 1.267090	+0.31783 0.5564	+0.001796 0.5505	+0.2173 4.6314
A OCT.17 (OH)	Y:	-0.1786	+0.00077	+ 31.9311 4.370765	+0.16981 4.0648		+0.0698 1.4534
OCT.17 (OH) (2448181.5)	X:	+0.5646	-0.00601	+101.3323 2.898873	+0.32235 2.2309	+0.001278 3.2340	+0.2209 1.6685
A OCT.21 (OH)	Y:	-0.1785	+0.00161	+ 32.5787 6.004610	+0.16780 5.7168		+0.0713 4.7746
OCT.21 (OH) (2448185.5)	X:	+0.5416	-0.00173	+102.3645 4.531377	+0.33508 3.8920	+0.004590 6.0822	+0.2248 4.9953
A OCT.25 (OH)	Y:	-0.1732	+0.00032	+ 33.2227 1.355794	+0.16520 1.0937		+0.0737 1.8234

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 1 DE JUPITER: IO N=3.5516

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
OCT.25 (0H) (2448189.5)	X:	+0.5316	-0.00398	+103.4530 6.164451	+0.33004 5.5689	+0.005699 1.1318	+0.2288 2.0348
A OCT.29 (0H)	Y:	-0.1709	+0.00096	+ 33.8630 2.990807	+0.16251 2.7491		+0.0755 5.1380
OCT.29 (0H) (2448193.5)	X:	+0.5110	-0.00105	+104.5792 1.514992	+0.32913 1.0021	+0.004762 2.7992	+0.2342 5.3580
A NOV. 2 (0H)	Y:	-0.1643	+0.00004	+ 34.4954 4.626303	+0.15932 4.4215		+0.0770 2.1875
NOV. 1 (0H) (2448196.5)	X:	+0.5034	-0.00499	+105.4586 5.882509	+0.33118 5.3961	+0.005988 0.9112	+0.2359 1.5662
A NOV. 5 (0H)	Y:	-0.1637	+0.00138	+ 34.9660 2.711925	+0.15687 2.5193		+0.0789 4.6740
NOV. 5 (0H) (2448200.5)	X:	+0.4792	-0.00196	+106.6615 1.234387	+0.32982 0.8280	+0.005375 2.4791	+0.2413 4.8910
A NOV. 9 (0H)	Y:	-0.1554	+0.00038	+ 35.5837 4.348564	+0.15257 4.1973		+0.0800 1.7216
NOV. 9 (0H) (2448204.5)	X:	+0.4618	-0.00445	+107.9024 2.870206	+0.32961 2.5638	+0.003712 4.0207	+0.2449 1.9323
A NOV.13 (0H)	Y:	-0.1507	+0.00140	+ 36.1880 5.985961	+0.14883 5.8751		+0.0820 5.0529
NOV.13 (0H) (2448208.5)	X:	+0.4434	-0.00531	+109.1866 4.506838	+0.32271 4.3233	+0.002961 3.9712	+0.2509 5.2579
A NOV.17 (0H)	Y:	-0.1451	+0.00160	+ 36.7793 1.340907	+0.14344 1.2701		+0.0844 2.0935
NOV.17 (0H) (2448212.5)	X:	+0.4213	-0.00757	+110.4874 6.144523	+0.33638 6.0150	+0.000566 5.2128	+0.2533 2.3008
A NOV.21 (0H)	Y:	-0.1380	+0.00244	+ 37.3509 2.979833	+0.13767 2.9489		+0.0861 5.4194
NOV.21 (0H) (2448216.5)	X:	+0.4006	-0.00934	+111.8181 1.499878	+0.34480 1.4092	+0.002402 3.3856	+0.2584 5.6252
A NOV.25 (0H)	Y:	-0.1311	+0.00313	+ 37.8991 4.619469	+0.13208 4.6413		+0.0875 2.4581
NOV.25 (0H) (2448220.5)	X:	+0.3693	-0.00842	+113.1770 3.139172	+0.34415 3.1300	+0.002008 5.3048	+0.2629 2.6773
A NOV.29 (0H)	Y:	-0.1218	+0.00296	+ 38.4271 6.259845	+0.12301 0.0598		+0.0888 5.8045
NOV.29 (0H) (2448224.5)	X:	+0.3415	-0.00818	+114.5443 4.779545	+0.34084 4.7807	+0.007096 0.1557	+0.2666 6.0006
A DEC. 3 (0H)	Y:	-0.1131	+0.00282	+ 38.9197 1.617817	+0.11575 1.7777		+0.0913 2.8388
DEC. 1 (0H) (2448226.5)	X:	+0.3282	-0.00855	+115.2204 5.599757	+0.34603 5.7344	+0.000740 3.3261	+0.2687 1.3798
A DEC. 5 (0H)	Y:	-0.1071	+0.00283	+ 39.1531 2.438675	+0.11219 2.6378		+0.0919 4.5045
DEC. 5 (0H) (2448230.5)	X:	+0.3026	-0.00937	+116.5745 0.958204	+0.35584 1.1370	+0.002906 3.6741	+0.2732 4.7078
A DEC. 9 (0H)	Y:	-0.0978	+0.00321	+ 39.5915 4.080983	+0.10492 4.3723		+0.0927 1.5416
DEC. 9 (0H) (2448234.5)	X:	+0.2701	-0.01037	+117.9358 2.600644	+0.34737 2.8563	+0.001906 4.6436	+0.2768 1.7604
A DEC.13 (0H)	Y:	-0.0878	+0.00369	+ 39.9933 5.724106	+0.09559 6.1200		+0.0930 4.8862

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 1 DE JUPITER: IO N=3.5516

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
DEC.13 (OH)	X:	+0.2389	-0.00948	+119.2650	+0.34449	+0.007360	+0.2808
(2448238.5)				4.244073	4.5216	6.1602	5.0871
A DEC.17 (OH)	Y:	-0.0781	+0.00337	+ 40.3473	+0.08762		+0.0957
				1.084694	1.6387		1.9320
DEC.17 (OH)	X:	+0.1983	-0.00616	+120.5643	+0.33435	+0.008977	+0.2863
(2448242.5)				5.888249	6.2375	1.2982	2.1393
A DEC.21 (OH)	Y:	-0.0633	+0.00197	+ 40.6491	+0.08040		+0.0971
				2.729318	3.4382		5.2518
DEC.21 (OH)	X:	+0.1695	-0.00730	+121.8085	+0.34273	+0.004498	+0.2889
(2448246.5)				1.249859	1.7421	3.0953	5.4669
A DEC.25 (OH)	Y:	-0.0520	+0.00250	+ 40.8937	+0.07777		+0.0962
				4.374423	5.2995		2.3058
DEC.25 (OH)	X:	+0.1310	-0.00395	+122.9965	+0.34523	+0.003941	+0.2940
(2448250.5)				2.895573	3.4852	5.0273	2.5154
A DEC.29 (OH)	Y:	-0.0401	+0.00153	+ 41.0822	+0.07448		+0.0973
				6.020365	0.8896		5.6487
DEC.29 (OH)	X:	+0.1061	-0.00904	+124.1166	+0.34818	+0.002193	+0.2965
(2448254.5)				4.542021	5.2522	1.9279	5.8506
A DEC.33 (OH)	Y:	-0.0313	+0.00294	+ 41.2046	+0.07386		+0.0981
				1.383746	2.7561		2.7007

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 2 DE JUPITER: EUROPE N=1.7693

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
JAN. 1 (OH)	X:	+2.7329	-0.19105	+221.8088	+0.67785	+0.082173	+0.9306
(2447892.5)				4.953638	1.0950	5.7068	4.5950
A JAN. 5 (OH)	Y:	-0.2369	+0.00499	+ 16.6974	+0.23391		+0.0688
				1.252029	4.7998		0.8946
JAN. 5 (OH)	X:	+1.9252	+0.19048	+220.8646	+0.29810	+0.110477	+0.9471
(2447896.5)				5.760228	0.2854	2.3779	6.2108
A JAN. 9 (OH)	Y:	-0.2200	+0.00207	+ 15.8514	+0.22980		+0.0654
				2.023159	5.6136		2.4876
JAN. 9 (OH)	X:	+1.8747	+0.33541	+220.3142	+0.23448	+0.160455	+0.9494
(2447900.5)				0.280268	0.5816	3.2532	1.5845
A JAN.13 (OH)	Y:	-0.2067	-0.00041	+ 15.0317	+0.22259		+0.0626
				2.791111	0.1390		4.1148
JAN.13 (OH)	X:	+4.5133	-1.03735	+217.3816	+2.54971	+0.502684	+1.0115
(2447904.5)				1.076436	2.5277	6.0042	3.2107
A JAN.17 (OH)	Y:	-0.1934	-0.00192	+ 14.2552	+0.21693		+0.0600
				3.556955	0.9431		5.7132
JAN.17 (OH)	X:	+1.0020	+0.76732	+219.4893	+1.92427	+0.346889	+1.0003
(2447908.5)				1.878815	5.0359	2.6375	4.9300
A JAN.21 (OH)	Y:	-0.2020	+0.00812	+ 13.5018	+0.19481		+0.0566
				4.320085	1.7337		1.0612
JAN.21 (OH)	X:	+3.2596	-0.23752	+216.6444	+0.42274	+0.171267	+0.9797
(2447912.5)				2.687926	1.0257	5.0109	0.3104
A JAN.25 (OH)	Y:	-0.1904	+0.00962	+ 12.8245	+0.18240		+0.0545
				5.082748	2.5406		2.6657
JAN.25 (OH)	X:	+2.9587	-0.18362	+214.8813	+0.11804	+0.116963	+0.9499
(2447916.5)				3.485972	5.6732	0.2194	1.9413
A JAN.29 (OH)	Y:	-0.1667	+0.00399	+ 12.2126	+0.16704		+0.0520
				5.843613	3.2900		4.2772
JAN.29 (OH)	X:	+1.4648	+0.62674	+211.8749	+1.41309	+0.275655	+0.9292
(2447920.5)				4.282600	5.7727	2.7189	3.5157
A FEV. 2 (OH)	Y:	-0.1536	+0.00440	+ 11.6599	+0.15042		+0.0503
				0.322795	4.0750		5.9008
FEV. 1 (OH)	X:	+3.4906	-0.41212	+211.6951	+0.37254	+0.203024	+0.9532
(2447923.5)				3.316782	1.9523	6.1568	1.6876
A FEV. 5 (OH)	Y:	-0.1481	+0.00477	+ 11.2840	+0.13371		+0.0486
				5.607897	3.0797		3.9524
FEV. 5 (OH)	X:	+1.2755	+0.73228	+208.1261	+1.60637	+0.321879	+0.9157
(2447927.5)				4.108468	5.6868	2.6748	3.3543
A FEV. 9 (OH)	Y:	-0.1337	+0.00416	+ 10.8447	+0.11510		+0.0475
				0.090640	3.8424		5.5783
FEV. 9 (OH)	X:	+4.0755	-0.66523	+208.5954	+1.77631	+0.275569	+0.8992
(2447931.5)				4.907144	2.0060	5.9231	4.9110
A FEV.13 (OH)	Y:	-0.1161	-0.00034	+ 10.4612	+0.09291		+0.0469
				0.860487	4.5852		0.8780
FEV.13 (OH)	X:	+1.7460	+0.49257	+204.6290	+0.48704	+0.228893	+0.9334
(2447935.5)				5.710865	4.9652	2.6333	0.2711
A FEV.17 (OH)	Y:	-0.1009	-0.00377	+ 10.1388	+0.07270		+0.0457
				1.635049	5.3186		2.5061
FEV.17 (OH)	X:	+3.4121	-0.26155	+202.1658	+1.04803	+0.180518	+0.9573
(2447939.5)				0.215776	2.3770	5.2055	1.9174
A FEV.21 (OH)	Y:	-0.0980	-0.00228	+ 9.8797	+0.05755		+0.0451
				2.415297	5.9930		4.1179

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 2 DE JUPITER: EUROPE N=1.7693

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
FEV.21 (OH)	X:	+3.5307	-0.43260	+199.5934	+1.10186	+0.214801	+0.9517
(2447943.5)				1.011022	3.2296	6.2802	3.5616
A FEV.25 (OH)	Y:	-0.0933	-0.00207	+ 9.6648	+0.04101		+0.0444
				3.200956	0.2380		5.7468
FEV.25 (OH)	X:	+0.6159	+1.06895	+199.7709	+2.84726	+0.498202	+0.9853
(2447947.5)				1.804189	5.3376	2.7651	5.2446
A FEV.29 (OH)	Y:	-0.1057	+0.00750	+ 9.4843	+0.02514		+0.0434
				3.993667	0.4231		1.1308
MAR. 1 (OH)	X:	+4.2480	-0.73974	+194.6398	+1.10301	+0.333621	+0.9081
(2447951.5)				2.608198	1.8138	5.7651	0.6230
A MAR. 5 (OH)	Y:	-0.0972	+0.00692	+ 9.3700	+0.02807		+0.0436
				4.793232	0.5217		2.7675
MAR. 5 (OH)	X:	+2.1492	+0.22068	+192.2340	+0.68480	+0.115027	+0.8868
(2447955.5)				3.390118	5.8148	2.0441	2.2353
A MAR. 9 (OH)	Y:	-0.0828	+0.00360	+ 9.3045	+0.04050		+0.0438
				5.598555	0.9626		4.4377
MAR. 9 (OH)	X:	+2.7067	+0.00321	+190.3291	+0.82261	+0.052730	+0.8737
(2447959.5)				4.183080	1.1277	4.0224	3.8300
A MAR.13 (OH)	Y:	-0.0749	+0.00060	+ 9.2832	+0.05491		+0.0446
				0.127418	1.5543		6.0743
MAR.13 (OH)	X:	+3.4045	-0.42994	+188.5209	+1.43405	+0.182054	+0.8611
(2447963.5)				4.972768	2.2939	6.0980	5.4593
A MAR.17 (OH)	Y:	-0.0662	-0.00227	+ 9.3082	+0.06941		+0.0452
				0.944737	2.2111		1.4485
MAR.17 (OH)	X:	+0.9073	+0.84741	+184.5885	+1.24049	+0.392358	+0.8962
(2447967.5)				5.771736	5.2044	2.9135	0.7465
A MAR.21 (OH)	Y:	-0.0738	+0.00168	+ 9.3960	+0.07962		+0.0461
				1.766896	2.9634		3.0927
MAR.21 (OH)	X:	+3.9153	-0.70237	+182.3283	+1.55176	+0.319723	+0.9196
(2447971.5)				0.261514	2.6062	5.8066	2.4358
A MAR.25 (OH)	Y:	-0.0592	-0.00555	+ 9.5247	+0.08968		+0.0469
				2.593422	3.6308		4.7818
MAR.25 (OH)	X:	+1.5387	+0.36161	+181.6746	+1.70671	+0.214495	+0.9099
(2447975.5)				1.057548	4.8270	2.1149	4.0987
A MAR.29 (OH)	Y:	-0.0627	-0.00474	+ 9.7151	+0.09844		+0.0480
				3.421573	4.3668		0.1551
MAR.29 (OH)	X:	+2.0431	+0.19344	+178.6878	+1.07330	+0.121210	+0.8799
(2447979.5)				1.844172	5.7504	3.3809	5.7225
A AVR. 2 (OH)	Y:	-0.0791	+0.00334	+ 9.9413	+0.11820		+0.0496
				4.250207	5.1016		1.8464
AVR. 1 (OH)	X:	+2.1381	-0.01046	+177.0885	+1.16988	+0.130811	+0.8948
(2447982.5)				0.862358	4.3894	1.2021	3.7891
A AVR. 5 (OH)	Y:	-0.0576	-0.00691	+ 10.1806	+0.11534		+0.0512
				3.302440	4.0972		6.2183
AVR. 5 (OH)	X:	+1.3711	+0.44492	+175.3889	+1.56691	+0.218893	+0.8801
(2447986.5)				1.648530	5.5417	2.9998	5.4300
A AVR. 9 (OH)	Y:	-0.0762	+0.00174	+ 10.5030	+0.13466		+0.0530
				4.130486	4.8608		1.6263

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 2 DE JUPITER: EUROPE N=1.7693

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
AVR. 9 (OH)	X:	+3.8212	-0.85975	+171.4974	+1.45098	+0.375870	+0.8494
(2447990.5)				2.442510	1.8356	5.8355	0.8228
A AVR.13 (OH)	Y:	-0.0795	+0.00485	+ 10.8974	+0.14331		+0.0555
				4.958374	5.6047		3.2919
AVR.13 (OH)	X:	+0.8293	+0.56972	+170.0936	+1.27358	+0.266029	+0.7993
(2447994.5)				3.211039	5.7821	2.6244	2.3805
A AVR.17 (OH)	Y:	-0.0744	+0.00200	+ 11.3469	+0.15092		+0.0579
				5.783736	0.1045		4.9423
AVR.17 (OH)	X:	+2.5271	-0.29418	+169.1199	+1.24156	+0.127268	+0.8148
(2447998.5)				4.003523	1.7639	5.5212	3.9851
A AVR.21 (OH)	Y:	-0.0645	-0.00174	+ 11.8391	+0.15983		+0.0610
				0.323133	0.8868		0.3264
AVR.21 (OH)	X:	+1.7449	-0.02506	+166.5632	+0.63282	+0.069387	+0.8270
(2448002.5)				4.786929	2.8726	1.4296	5.5895
A AVR.25 (OH)	Y:	-0.0760	+0.00368	+ 12.3904	+0.16084		+0.0638
				1.144220	1.6496		1.9779
AVR.25 (OH)	X:	+0.8473	+0.44005	+164.2956	+0.63451	+0.211618	+0.8321
(2448006.5)				5.572340	4.8398	3.0114	0.9253
A AVR.29 (OH)	Y:	-0.0727	+0.00416	+ 12.9717	+0.16646		+0.0669
				1.961550	2.4270		3.6318
AVR.29 (OH)	X:	+3.4543	-0.96170	+162.8960	+1.88720	+0.430925	+0.8803
(2448010.5)				0.056465	2.6220	5.9182	2.5686
A MAI 3 (OH)	Y:	-0.0482	-0.00707	+ 13.5968	+0.16883		+0.0712
				2.778885	3.1018		5.2995
MAI 1 (OH)	X:	+1.1356	+0.19669	+162.2431	+0.65875	+0.108358	+0.7929
(2448012.5)				3.597758	0.6250	3.1423	3.4078
A MAI 5 (OH)	Y:	-0.0602	-0.00031	+ 13.9044	+0.18007		+0.0724
				0.041709	0.4036		6.1253
MAI 5 (OH)	X:	+2.3902	-0.54661	+161.7103	+1.59497	+0.224352	+0.7871
(2448016.5)				4.384120	2.3355	6.1405	4.9716
A MAI 9 (OH)	Y:	-0.0628	+0.00165	+ 14.5809	+0.18312		+0.0753
				0.852912	1.1618		1.4756
MAI 9 (OH)	X:	+0.0557	+0.58819	+158.2302	+0.87563	+0.274990	+0.8205
(2448020.5)				5.167519	4.9225	2.7775	0.3130
A MAI 13 (OH)	Y:	-0.0654	+0.00740	+ 15.2929	+0.18147		+0.0800
				1.660283	1.9457		3.1284
MAI 13 (OH)	X:	+2.6183	-0.72160	+158.0901	+1.57232	+0.325997	+0.8510
(2448024.5)				5.934900	2.5101	5.6937	1.9720
A MAI 17 (OH)	Y:	-0.0409	-0.00115	+ 16.0191	+0.18744		+0.0838
				2.467757	2.6397		4.7842
MAI 17 (OH)	X:	+0.7568	+0.06576	+156.8349	+0.98859	+0.079349	+0.8091
(2448028.5)				0.442745	4.5928	1.7000	3.6088
A MAI 21 (OH)	Y:	-0.0260	-0.00586	+ 16.7729	+0.19112		+0.0879
				3.270791	3.4045		0.1345
MAI 21 (OH)	X:	-0.1414	+0.51543	+156.2568	+1.79067	+0.270428	+0.8228
(2448032.5)				1.224741	5.5406	2.9481	5.2525
A MAI 25 (OH)	Y:	-0.0431	+0.00720	+ 17.5260	+0.20450		+0.0924
				4.071896	4.1714		1.7916
MAI 25 (OH)	X:	+1.8520	-0.58360	+153.0863	+0.84092	+0.249668	+0.7705
(2448036.5)				2.005670	1.7335	5.9376	0.5917
A MAI 29 (OH)	Y:	-0.0253	+0.00307	+ 18.3262	+0.20555		+0.0961
				4.870803	4.9483		3.4145

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 2 DE JUPITER: EUROPE N=1.7693

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
MAI 29 (OH)	X:	-0.4618	+0.48063	+153.1385	+1.11914	+0.227460	+0.7442
(2448040.5)				2.774233	5.8158	2.6131	2.1825
A JUN. 2 (OH)	Y:	-0.0110	+0.00433	+ 19.1416	+0.20832		+0.0999
				5.667969	5.7094		5.0591
JUN. 1 (OH)	X:	+1.6681	-0.59795	+151.0483	+0.85059	+0.255337	+0.7592
(2448043.5)				1.798430	1.6979	5.8390	0.2828
A JUN. 5 (OH)	Y:	-0.0022	+0.00303	+ 19.7585	+0.21094		+0.1036
				4.694370	4.7103		3.1358
JUN. 5 (OH)	X:	-0.3781	+0.30748	+151.4243	+0.87046	+0.154223	+0.7442
(2448047.5)				2.569585	5.8790	2.4661	1.8723
A JUN. 9 (OH)	Y:	+0.0134	+0.00516	+ 20.5988	+0.21431		+0.1074
				5.488855	5.4698		4.7777
JUN. 9 (OH)	X:	+0.5787	-0.17522	+150.5251	+0.94239	+0.073866	+0.7578
(2448051.5)				3.356075	1.5571	5.3338	3.4551
A JUN.13 (OH)	Y:	+0.0347	+0.00064	+ 21.4458	+0.21733		+0.1122
				6.281938	6.2580		0.1096
JUN.13 (OH)	X:	+0.6051	-0.32309	+149.8976	+1.15468	+0.137375	+0.7503
(2448055.5)				4.134962	2.3764	6.2140	5.0755
A JUN.17 (OH)	Y:	+0.0513	+0.00323	+ 22.3149	+0.21773		+0.1160
				0.790722	0.7294		1.7548
JUN.17 (OH)	X:	-1.3408	+0.64279	+147.4235	+0.96783	+0.315133	+0.7887
(2448059.5)				4.914140	5.1294	2.9025	0.3818
A JUN.21 (OH)	Y:	+0.0398	+0.01920	+ 23.2133	+0.20740		+0.1216
				1.581643	1.4729		3.3698
JUN.21 (OH)	X:	+0.9557	-0.59174	+148.5206	+1.28998	+0.261234	+0.7930
(2448063.5)				5.682901	2.6438	5.8060	2.0597
A JUN.25 (OH)	Y:	+0.1011	+0.00036	+ 24.0759	+0.22348		+0.1259
				2.372403	2.2164		5.0198
JUN.25 (OH)	X:	-0.9746	+0.23848	+147.8513	+1.35914	+0.154064	+0.7736
(2448067.5)				0.190413	4.7890	2.1107	3.7059
A JUN.29 (OH)	Y:	+0.1201	+0.00119	+ 24.9690	+0.22843		+0.1303
				3.161823	2.9527		0.3617
JUN.29 (OH)	X:	-0.6849	+0.11811	+146.9495	+0.86100	+0.085958	+0.7535
(2448071.5)				0.965812	5.6994	3.4212	5.3129
A JUL. 3 (OH)	Y:	+0.1350	+0.00493	+ 25.8573	+0.23192		+0.1346
				3.949395	3.7633		1.9879
JUL. 1 (OH)	X:	-1.9009	+0.64773	+145.1707	+0.98892	+0.319274	+0.7832
(2448073.5)				4.494750	5.0437	2.6950	6.0541
A JUL. 5 (OH)	Y:	+0.1141	+0.02174	+ 26.3474	+0.21647		+0.1379
				1.201379	0.9822		2.7932
JUL. 5 (OH)	X:	-0.1915	-0.23051	+146.4980	+0.73770	+0.112526	+0.7638
(2448077.5)				5.270458	2.7099	5.3713	1.4370
A JUL. 9 (OH)	Y:	+0.1732	+0.00707	+ 27.2320	+0.23011		+0.1406
				1.988677	1.7669		4.4310
JUL. 9 (OH)	X:	-0.1801	-0.38300	+146.1010	+0.92862	+0.185272	+0.7757
(2448081.5)				6.048668	3.4383	0.0900	3.0608
A JUL.13 (OH)	Y:	+0.2182	-0.00278	+ 28.1513	+0.24176		+0.1467
				2.776584	2.4671		6.0561
JUL.13 (OH)	X:	-1.8960	+0.48157	+146.0808	+1.56955	+0.229586	+0.7535
(2448085.5)				0.552812	5.3565	2.8367	4.7099
A JUL.17 (OH)	Y:	+0.2260	+0.00618	+ 29.0603	+0.24133		+0.1499
				3.561535	3.3033		1.4016

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 2 DE JUPITER: EUROPE N=1.7693

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
JUL.17 (OH)	X:	+0.2393	-0.64426	+143.9452	+0.93566	+0.270945	+0.7142
(2448089.5)				1.325329	1.6992	5.7466	0.0660
A JUL.21 (OH)	Y:	+0.2534	+0.00812	+ 29.9921	+0.24543		+0.1535
				4.347190	4.0620		3.0348
JUL.21 (OH)	X:	-1.9392	+0.35845	+145.7341	+0.99083	+0.170384	+0.7050
(2448093.5)				2.099999	5.8088	2.5663	1.6080
A JUL.25 (OH)	Y:	+0.2781	+0.00803	+ 30.9256	+0.24794		+0.1575
				5.132482	4.8416		4.6410
JUL.25 (OH)	X:	-1.1917	-0.03010	+145.1772	+0.75914	+0.050844	+0.7137
(2448097.5)				2.883298	1.2077	4.3921	3.2386
A JUL.29 (OH)	Y:	+0.3217	+0.00261	+ 31.8703	+0.24645		+0.1620
				5.916851	5.6271		6.2814
JUL.29 (OH)	X:	-0.8890	-0.29905	+145.1724	+1.01469	+0.131709	+0.7262
(2448101.5)				3.664359	2.4235	0.1814	4.8266
A AOU. 2 (OH)	Y:	+0.3304	+0.00985	+ 32.8295	+0.24606		+0.1659
				0.418814	0.0865		1.6164
AOU. 1 (OH)	X:	-1.8086	+0.18841	+145.3174	+0.69040	+0.104840	+0.7027
(2448104.5)				2.672310	0.4819	3.2271	2.9391
A AOU. 5 (OH)	Y:	+0.3691	+0.00466	+ 33.5325	+0.25167		+0.1692
				5.719142	5.3967		5.9869
AOU. 5 (OH)	X:	-0.6072	-0.51391	+145.4682	+1.44357	+0.219204	+0.7179
(2448108.5)				3.459345	2.2794	6.1619	4.5068
A AOU. 9 (OH)	Y:	+0.3898	+0.00504	+ 34.4926	+0.25155		+0.1726
				0.220476	6.1640		1.3148
AOU. 9 (OH)	X:	-2.8499	+0.59075	+144.1964	+0.83449	+0.275114	+0.7499
(2448112.5)				4.229017	5.0457	2.7432	6.1463
A AOU.13 (OH)	Y:	+0.3983	+0.01770	+ 35.4795	+0.24510		+0.1789
				1.004367	0.6261		2.9463
AOU.13 (OH)	X:	-0.4487	-0.60338	+146.7917	+1.45677	+0.279619	+0.7609
(2448116.5)				5.006740	2.4321	5.6257	1.5409
A AOU.17 (OH)	Y:	+0.4591	+0.00192	+ 36.4163	+0.26709		+0.1822
				1.789429	1.3824		4.5842
AOU.17 (OH)	X:	-1.9309	+0.01894	+146.0635	+0.82100	+0.065106	+0.7288
(2448120.5)				5.792007	4.3509	1.3439	3.1591
A AOU.21 (OH)	Y:	+0.4858	+0.00134	+ 37.3933	+0.26444		+0.1861
				2.572816	2.1842		6.2002
AOU.21 (OH)	X:	-2.7755	+0.47154	+146.6360	+1.55589	+0.232709	+0.7332
(2448124.5)				0.293185	5.4324	2.8957	4.8123
A AOU.25 (OH)	Y:	+0.4815	+0.01511	+ 38.3486	+0.27206		+0.1902
				3.356372	2.9969		1.5572
AOU.25 (OH)	X:	-0.8884	-0.53255	+145.8953	+0.69546	+0.232599	+0.6875
(2448128.5)				1.063543	1.8298	5.9435	0.1291
A AOU.29 (OH)	Y:	+0.5308	+0.00282	+ 39.3593	+0.26485		+0.1924
				4.140346	3.7569		3.1675
AOU.29 (OH)	X:	-2.9896	+0.48465	+148.3928	+1.17168	+0.222330	+0.6819
(2448132.5)				1.843138	5.7795	2.6735	1.7117
A SEP. 2 (OH)	Y:	+0.5433	+0.00956	+ 40.3407	+0.27301		+0.1957
				4.924369	4.5423		4.8043
SEP. 1 (OH)	X:	-0.9139	-0.55446	+146.9474	+0.72218	+0.242225	+0.6830
(2448135.5)				0.856581	1.8324	5.8723	6.1069
A SEP. 5 (OH)	Y:	+0.5718	+0.00218	+ 41.0973	+0.26837		+0.1990
				3.941635	3.5497		2.8733

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 2 DE JUPITER: EUROPE N=1.7693

		AO	A1	BO FO	B1 F1	B2 F2	CO PO
SEP. 5 (OH)	X:	-2.8476	+0.36742	+149.4151	+0.99281	+0.171388	+0.6872
(2448139.5)				1.639375	5.7706	2.5554	1.4128
A SEP. 9 (OH)	Y:	+0.5802	+0.00879	+ 42.0858	+0.27612		+0.2024
				4.725780	4.3443		4.5099
SEP. 9 (OH)	X:	-1.4609	-0.28719	+149.1221	+1.10980	+0.140825	+0.7186
(2448143.5)				2.426227	1.6653	5.5717	3.0060
A SEP.13 (OH)	Y:	+0.6276	-0.00826	+ 43.1067	+0.26172		+0.2080
				5.509626	5.1475		6.1209
SEP.13 (OH)	X:	-1.6601	-0.26669	+150.2013	+0.99455	+0.127252	+0.7114
(2448147.5)				3.206109	2.3769	0.0486	4.6427
A SEP.17 (OH)	Y:	+0.6279	+0.00003	+ 44.1123	+0.27017		+0.2097
				0.011180	5.9270		1.4800
SEP.17 (OH)	X:	-3.5207	+0.72513	+150.1381	+1.03582	+0.341871	+0.7608
(2448151.5)				3.978738	5.3108	2.9246	6.2659
A SEP.21 (OH)	Y:	+0.6012	+0.02109	+ 45.1708	+0.26373		+0.2163
				0.796588	0.3343		3.0993
SEP.21 (OH)	X:	-0.9704	-0.57826	+153.4263	+1.33057	+0.264866	+0.7471
(2448155.5)				4.764818	2.5690	5.7948	1.6678
A SEP.25 (OH)	Y:	+0.6639	-0.00384	+ 46.1418	+0.28231		+0.2188
				1.581548	1.1970		4.7415
SEP.25 (OH)	X:	-2.9668	+0.36374	+152.9794	+1.38826	+0.174146	+0.7196
(2448159.5)				5.554784	4.8216	2.2428	3.3202
A SEP.29 (OH)	Y:	+0.6635	-0.00301	+ 47.1643	+0.28518		+0.2205
				2.366815	1.9811		0.0911
SEP.29 (OH)	X:	-2.1392	+0.02328	+154.3716	+0.56899	+0.043802	+0.7087
(2448163.5)				0.048598	5.7387	4.0275	4.9119
A OCT. 3 (OH)	Y:	+0.6611	+0.00362	+ 48.1993	+0.27797		+0.2245
				3.152173	2.8043		1.7133
OCT. 1 (OH)	X:	-3.7755	+0.81389	+154.2493	+1.25015	+0.377822	+0.7715
(2448165.5)				3.572785	5.2043	2.7269	5.6912
A OCT. 5 (OH)	Y:	+0.6267	+0.02076	+ 48.7707	+0.26655		+0.2293
				0.404202	6.2332		2.5293
OCT. 5 (OH)	X:	-1.4173	-0.31949	+157.2436	+0.91735	+0.159119	+0.7411
(2448169.5)				4.365590	2.5249	5.4919	1.0802
A OCT. 9 (OH)	Y:	+0.6763	-0.00096	+ 49.7530	+0.27683		+0.2298
				1.189928	0.8424		4.1676
OCT. 9 (OH)	X:	-1.8366	-0.17365	+158.1642	+0.81077	+0.127557	+0.7424
(2448173.5)				5.150215	3.7178	0.2743	2.7170
A OCT.13 (OH)	Y:	+0.6993	-0.01647	+ 50.7698	+0.29214		+0.2340
				1.977114	1.6137		5.8003
OCT.13 (OH)	X:	-2.7721	+0.36956	+159.0842	+1.23779	+0.164248	+0.7223
(2448177.5)				5.938564	5.3948	2.8983	4.3529
A OCT.17 (OH)	Y:	+0.6595	+0.00339	+ 51.8173	+0.27353		+0.2358
				2.763408	2.4719		1.1487
OCT.17 (OH)	X:	-1.0259	-0.49297	+160.2857	+0.68900	+0.213554	+0.6967
(2448181.5)				0.430988	1.6866	5.8800	5.9844
A OCT.21 (OH)	Y:	+0.6484	+0.00370	+ 52.8476	+0.27308		+0.2381
				3.550879	3.2801		2.7951
OCT.21 (OH)	X:	-3.1249	+0.57343	+163.6492	+1.27694	+0.247763	+0.7118
(2448185.5)				1.224096	5.8165	2.7768	1.2526
A OCT.25 (OH)	Y:	+0.6510	+0.00143	+ 53.8855	+0.26927		+0.2412
				4.339327	4.0778		4.4092

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 2 DE JUPITER: EUROPE N=1.7693

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
OCT.25 (OH)	X:	-1.3171	-0.27877	+163.7299	+1.13415	+0.137575	+0.7396
(2448189.5)				2.011716	1.7730	5.5986	2.9150
A OCT.29 (OH)	Y:	+0.6579	-0.01070	+ 54.9225	+0.25288		+0.2459
				5.127453	4.9131		6.0601
OCT.29 (OH)	X:	-2.0214	+0.01888	+165.8790	+0.54584	+0.099693	+0.7606
(2448193.5)				2.795396	3.0303	1.2728	4.5502
A NOV. 2 (OH)	Y:	+0.6209	-0.00156	+ 55.9517	+0.25119		+0.2486
				5.917661	5.6409		1.4105
NOV. 1 (OH)	X:	-1.5579	-0.09732	+167.1729	+0.85081	+0.070585	+0.7390
(2448196.5)				1.817967	1.5003	5.1337	2.6448
A NOV. 5 (OH)	Y:	+0.6249	-0.00899	+ 56.6889	+0.24579		+0.2505
				4.938402	4.7710		5.7894
NOV. 5 (OH)	X:	-1.3838	-0.24022	+169.0105	+0.99980	+0.148435	+0.7648
(2448200.5)				2.607176	2.5948	0.3200	4.2625
A NOV. 9 (OH)	Y:	+0.6040	-0.00960	+ 57.6915	+0.23854		+0.2534
				5.729438	5.5306		1.1348
NOV. 9 (OH)	X:	-2.7844	+0.56652	+170.9579	+0.84767	+0.257147	+0.7824
(2448204.5)				3.388828	5.0184	2.8354	5.9240
A NOV.13 (OH)	Y:	+0.5502	+0.00767	+ 58.6642	+0.23386		+0.2575
				0.237389	0.0631		2.7767
NOV.13 (OH)	X:	-0.0956	-0.71097	+174.9061	+1.62277	+0.352774	+0.7912
(2448208.5)				4.188714	2.4408	5.7102	1.3456
A NOV.17 (OH)	Y:	+0.5983	-0.02999	+ 59.5467	+0.25472		+0.2592
				1.029447	0.9089		4.4346
NOV.17 (OH)	X:	-2.0057	+0.22081	+174.9858	+1.01881	+0.091936	+0.7528
(2448212.5)				4.978464	4.8816	2.2327	2.9575
A NOV.21 (OH)	Y:	+0.5308	-0.01015	+ 60.4956	+0.23086		+0.2604
				1.821606	1.7806		6.0613
NOV.21 (OH)	X:	-1.6987	+0.17013	+177.3297	+0.87547	+0.075227	+0.7585
(2448216.5)				5.769731	5.6894	3.0107	4.6100
A NOV.25 (OH)	Y:	+0.4641	+0.00294	+ 61.3810	+0.21661		+0.2620
				2.614234	2.6811		1.4411
NOV.25 (OH)	X:	-1.0699	-0.14772	+179.6070	+0.42461	+0.071280	+0.7529
(2448220.5)				0.276877	0.8601	0.0039	6.2156
A NOV.29 (OH)	Y:	+0.4504	+0.00202	+ 62.2268	+0.20733		+0.2648
				3.408701	3.5299		3.0634
NOV.29 (OH)	X:	-2.0835	+0.45664	+182.6198	+0.84676	+0.199451	+0.7553
(2448224.5)				1.074143	6.1572	2.9044	1.5591
A DEC. 3 (OH)	Y:	+0.4155	-0.00081	+ 63.0310	+0.19198		+0.2655
				4.203387	4.3974		4.7250
DEC. 1 (OH)	X:	-0.9805	-0.12285	+183.1309	+0.56256	+0.089661	+0.7853
(2448226.5)				4.612032	4.0751	0.1268	2.4242
A DEC. 5 (OH)	Y:	+0.4320	-0.01809	+ 63.3863	+0.19673		+0.2685
				1.460001	1.6342		5.5379
DEC. 5 (OH)	X:	-2.0061	+0.48175	+184.4320	+1.49612	+0.201963	+0.7829
(2448230.5)				5.410236	5.4205	2.6700	4.1038
A DEC. 9 (OH)	Y:	+0.3494	-0.00156	+ 64.1162	+0.17557		+0.2678
				2.255327	2.5889		0.9213
DEC. 9 (OH)	X:	-0.2603	-0.36171	+187.2033	+0.65616	+0.159726	+0.7614
(2448234.5)				6.198623	1.4695	6.0006	5.6977
A DEC.13 (OH)	Y:	+0.3214	+0.00242	+ 64.7612	+0.16571		+0.2702
				3.052414	3.5044		2.5494

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 2 DE JUPITER: EUROPE N=1.7693

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
DEC.13 (0H) (2448238.5)	X:	-1.6858	+0.43158	+189.9846 0.719222	+0.80685 6.0847	+0.188840 2.7748	+0.7819 1.0458
A DEC.17 (0H)	Y:	+0.2777	+0.00184	+ 65.3381 3.849823	+0.15338 4.4459		+0.2707 4.2122
DEC.17 (0H) (2448242.5)	X:	+0.3476	-0.51111	+190.2229 1.515568	+1.77279 2.0626	+0.268619 5.7100	+0.8304 2.6830
A DEC.21 (0H)	Y:	+0.3197	-0.03625	+ 65.8945 4.648275	+0.11598 5.5208		+0.2758 5.8513
DEC.21 (0H) (2448246.5)	X:	-0.6218	-0.03085	+193.2847 2.312533	+0.74428 3.1346	+0.069980 0.8950	+0.8180 4.3630
A DEC.25 (0H)	Y:	+0.2155	-0.00831	+ 66.2504 5.447525	+0.12431 0.0972		+0.2738 1.2303
DEC.25 (0H) (2448250.5)	X:	-1.9314	+0.76523	+195.3855 3.106158	+1.39694 5.2396	+0.347757 2.9661	+0.8650 6.0169
A DEC.29 (0H)	Y:	+0.1581	+0.00150	+ 66.5768 6.248143	+0.09347 0.9696		+0.2774 2.8725
DEC.29 (0H) (2448254.5)	X:	+0.6687	-0.51186	+197.9468 3.916805	+0.81650 2.6431	+0.249863 5.8085	+0.8353 1.4252
A DEC.33 (0H)	Y:	+0.1658	-0.02347	+ 66.7212 0.764496	+0.13420 1.9971		+0.2745 4.5330

1990 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:	+0.1010	-0.04384	+234.1386	+0.79616	+0.013047	+0.1987
(2448073.5)				0.547769	5.0847	5.3771	4.3736
A JUL. 9 (OH)	Y:	+0.0542	-0.00684	+ 39.3462	+0.36810		+0.0380
				3.529965	3.3095		1.0698
JUL. 9 (OH)	X:	-0.3840	+0.04927	+233.3803	+1.02662	+0.015617	+0.2245
(2448081.5)				1.259871	5.7442	2.3117	5.8388
A JUL.17 (OH)	Y:	+0.0456	-0.00355	+ 42.2684	+0.37825		+0.0423
				4.257616	3.9987		2.5817
JUL.17 (OH)	X:	+0.0693	-0.05208	+232.1007	+0.91998	+0.013319	+0.2252
(2448089.5)				1.972010	0.4731	5.4163	1.0922
A JUL.25 (OH)	Y:	+0.0545	-0.00546	+ 45.2385	+0.38491		+0.0444
				4.983008	4.6927		4.0543
JUL.25 (OH)	X:	-0.5061	+0.07339	+231.9939	+0.77362	+0.021518	+0.1824
(2448097.5)				2.680918	0.9208	2.3207	2.5577
A AOU. 2 (OH)	Y:	+0.0262	+0.00068	+ 48.2369	+0.39742		+0.0410
				5.707268	5.3795		5.4640
AOU. 1 (OH)	X:	-0.6817	+0.12582	+232.2146	+0.75711	+0.033565	+0.1643
(2448104.5)				2.517524	0.6609	2.3477	2.1289
A AOU. 9 (OH)	Y:	+0.0182	+0.00012	+ 50.8953	+0.40593		+0.0421
				5.554589	5.1953		5.0523
AOU. 9 (OH)	X:	-0.0691	+0.02113	+232.6777	+0.93775	+0.017547	+0.1805
(2448112.5)				3.231891	1.6561	4.0168	3.3405
A AOU.17 (OH)	Y:	+0.0051	+0.00137	+ 53.9547	+0.41301		+0.0463
				6.276215	5.9055		0.1180
AOU.17 (OH)	X:	+0.0992	-0.05340	+233.5195	+0.99869	+0.016899	+0.2340
(2448120.5)				3.945275	2.6255	0.2317	4.7224
A AOU.25 (OH)	Y:	+0.0112	+0.00058	+ 57.0476	+0.42006		+0.0566
				0.714293	0.3341		1.5483
AOU.25 (OH)	X:	-0.4339	+0.09353	+234.6043	+0.73925	+0.023912	+0.2636
(2448128.5)				4.657677	3.5473	3.1157	6.2584
A SEP. 2 (OH)	Y:	-0.0129	+0.01025	+ 60.2136	+0.41931		+0.0651
				1.435617	1.0341		3.0399
SEP. 1 (OH)	X:	-0.1995	+0.01931	+236.6131	+0.80051	+0.008471	+0.2590
(2448135.5)				4.497069	3.2521	3.9264	6.0524
A SEP. 9 (OH)	Y:	+0.0226	+0.00535	+ 62.9662	+0.42704		+0.0687
				1.281531	0.8806		2.8130
SEP. 9 (OH)	X:	-0.0974	-0.02829	+239.1482	+0.94799	+0.015548	+0.2327
(2448143.5)				5.213164	3.9770	0.4478	1.2481
A SEP.17 (OH)	Y:	+0.0451	+0.00043	+ 66.1430	+0.43591		+0.0685
				2.003691	1.6020		4.2805
SEP.17 (OH)	X:	-0.1370	+0.01002	+241.8700	+0.81438	+0.006668	+0.2368
(2448151.5)				5.929222	4.9249	4.3481	2.5718
A SEP.25 (OH)	Y:	+0.0401	+0.00124	+ 69.3736	+0.43573		+0.0701
				2.726264	2.3369		5.6933
SEP.25 (OH)	X:	-0.0912	-0.00471	+245.4809	+0.82039	+0.010006	+0.2629
(2448159.5)				0.364402	5.5932	0.8283	3.9444
A OCT. 3 (OH)	Y:	+0.0405	-0.00320	+ 72.6398	+0.43617		+0.0771
				3.450165	3.0615		0.7443

1990 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:	-0.3259	+0.07799	+248.0525	+0.89095	+0.022322	+0.2759
(2448165.5)				5.617283	4.9149	3.4749	1.7987
A OCT. 9 (0H)	Y:	+0.0029	+0.00727	+ 75.0876	+0.43099		+0.0842
				2.422735	2.0603		4.9608
OCT. 9 (0H)	X:	+0.0804	-0.06166	+252.7438	+0.72789	+0.020317	+0.3328
(2448173.5)				0.054545	5.4327	0.2898	3.3544
A OCT.17 (0H)	Y:	+0.0440	-0.00050	+ 78.3618	+0.43248		+0.1005
				3.149362	2.8001		0.1569
OCT.17 (0H)	X:	-0.5961	+0.10525	+257.8203	+1.05383	+0.029998	+0.3468
(2448181.5)				0.780698	6.1911	2.8225	4.9475
A OCT.25 (0H)	Y:	+0.0226	+0.01189	+ 81.5917	+0.43187		+0.1082
				3.877412	3.5755		1.7155
OCT.25 (0H)	X:	-0.0838	-0.05415	+262.7446	+0.82511	+0.010510	+0.3347
(2448189.5)				1.505510	1.0354	0.5165	0.1238
A NOV. 2 (0H)	Y:	+0.0780	+0.00436	+ 84.8560	+0.41428		+0.1111
				4.607611	4.3467		3.2206
NOV. 1 (0H)	X:	+0.1254	-0.11135	+267.6331	+0.83942	+0.022825	+0.3165
(2448196.5)				1.357720	1.1357	0.1824	6.1138
A NOV. 9 (0H)	Y:	+0.0787	+0.00460	+ 87.6369	+0.39843		+0.1087
				4.463033	4.2545		2.9358
NOV. 9 (0H)	X:	-0.7453	+0.12294	+274.6498	+0.64588	+0.034534	+0.3390
(2448204.5)				2.089378	1.5201	2.8058	1.2107
A NOV.17 (0H)	Y:	+0.0771	+0.00456	+ 90.7190	+0.37872		+0.1128
				5.198344	5.0434		4.3644
NOV.17 (0H)	X:	-0.2977	+0.02013	+280.8125	+0.82885	+0.011113	+0.3745
(2448212.5)				2.825259	2.6079	3.8103	2.6867
A NOV.25 (0H)	Y:	+0.1286	-0.00954	+ 93.6309	+0.34530		+0.1261
				5.935370	5.9178		5.8253
NOV.25 (0H)	X:	+0.3243	-0.14755	+287.9163	+1.02281	+0.041629	+0.4248
(2448220.5)				3.566027	3.1988	5.7410	4.1343
A DEC. 3 (0H)	Y:	+0.1867	-0.02309	+ 96.2830	+0.31921		+0.1444
				0.392888	0.5244		1.0191
DEC. 1 (0H)	X:	-0.3272	+0.00433	+292.8280	+0.86586	+0.012264	+0.4586
(2448226.5)				2.549822	2.5765	4.1936	2.1837
A DEC. 9 (0H)	Y:	+0.1797	-0.01232	+ 98.1664	+0.27702		+0.1514
				5.662908	5.9218		5.3331
DEC. 9 (0H)	X:	-0.0296	-0.09507	+299.9016	+0.91441	+0.029545	+0.4717
(2448234.5)				3.296135	3.2859	5.4971	3.7391
A DEC.17 (0H)	Y:	+0.2394	-0.02202	+100.2443	+0.24411		+0.1587
				0.126142	0.6256		0.6144
DEC.17 (0H)	X:	-0.8425	+0.08390	+306.0218	+1.02214	+0.013051	+0.4894
(2448242.5)				4.043352	4.5349	2.0159	5.2814
A DEC.25 (0H)	Y:	+0.2022	-0.01547	+101.8982	+0.20265		+0.1589
				0.876416	1.6587		2.1605
DEC.25 (0H)	X:	-0.4886	+0.02257	+312.5696	+0.88396	+0.004208	+0.4899
(2448250.5)				4.795458	5.4796	4.0391	0.5149
A DEC.33 (0H)	Y:	+0.1198	+0.00196	+103.0090	+0.18809		+0.1612
				1.628857	2.9040		3.6462

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 4 DE JUPITER: CALLISTO N=0.3765

		A0	A1	B0 F0	B1 F1	C0 P0
JAN. 1 (0H)	X:	+25.0038	- 4.21051	+621.5903	+ 4.46704	+3.5473
(2447892.5)				0.575708	2.8911	3.3899
A JAN. 9 (0H)	Y:	- 0.7452	+ 0.12047	+ 40.7478	+ 0.71564	+0.1776
				3.192627	0.4432	6.0793
JAN. 9 (0H)	X:	+ 2.8400	+ 0.32152	+615.6136	+ 2.06934	+2.8411
(2447900.5)				3.636402	5.5633	3.3551
A JAN.17 (0H)	Y:	- 0.7559	+ 0.11355	+ 35.4064	+ 0.51806	+0.1584
				6.169059	3.5628	6.0498
JAN.17 (0H)	X:	- 0.7053	+ 1.80741	+609.1153	+ 0.67285	+1.9938
(2447908.5)				0.401680	1.6264	2.9380
A JAN.25 (0H)	Y:	+ 0.2342	- 0.02656	+ 31.5285	+ 0.51932	+0.1068
				2.830157	0.3975	5.4043
JAN.25 (0H)	X:	- 4.5887	+ 2.88533	+609.9236	+ 3.63233	+2.3728
(2447916.5)				3.391964	6.2504	2.5683
A FEV. 2 (0H)	Y:	+ 0.1614	- 0.14910	+ 28.8412	+ 0.54167	+0.0971
				5.748434	3.3387	4.7939
FEV. 1 (0H)	X:	- 5.9561	+ 3.38347	+580.0038	+ 1.80149	+2.7194
(2447923.5)				6.074800	0.9361	1.4382
A FEV. 9 (0H)	Y:	+ 0.5697	- 0.10697	+ 24.9829	+ 0.24516	+0.1345
				2.037079	5.8887	3.9128
FEV. 9 (0H)	X:	+21.5257	- 3.63823	+566.3419	+ 1.45939	+2.7716
(2447931.5)				2.815654	3.7081	1.8407
A FEV.17 (0H)	Y:	- 0.3454	- 0.02173	+ 23.4521	+ 0.20138	+0.0898
				4.989165	2.8153	3.6783
FEV.17 (0H)	X:	+ 6.0770	- 0.27706	+570.3800	+ 1.87561	+2.0227
(2447939.5)				5.815771	2.8623	1.2215
A FEV.25 (0H)	Y:	- 0.5401	+ 0.16595	+ 22.6731	+ 0.18866	+0.0657
				1.687712	5.9963	3.6621
FEV.25 (0H)	X:	- 1.2914	+ 1.65704	+563.2777	+ 3.00586	+2.5872
(2447947.5)				2.538348	5.9803	0.8472
A MAR. 5 (0H)	Y:	- 0.1120	- 0.02994	+ 21.2282	+ 0.02967	+0.0894
				4.667643	0.6706	2.8139
MAR. 1 (0H)	X:	-10.1413	+ 4.19342	+544.6123	+ 4.49001	+1.6063
(2447951.5)				4.009961	0.4505	4.3629
A MAR. 9 (0H)	Y:	- 0.3343	+ 0.02350	+ 20.8937	+ 0.07666	+0.0704
				6.179859	1.2724	6.2094
MAR. 9 (0H)	X:	+12.9193	- 1.56917	+531.5209	+ 2.41162	+2.3553
(2447959.5)				0.758017	3.7120	3.5056
A MAR.17 (0H)	Y:	+ 0.6776	- 0.16360	+ 20.1684	+ 0.25488	+0.0849
				2.968317	3.7655	5.5058
MAR.17 (0H)	X:	+13.1787	- 1.94413	+519.5267	+ 1.48924	+2.7034
(2447967.5)				3.796735	1.9287	3.4275
A MAR.25 (0H)	Y:	- 1.0479	+ 0.17453	+ 20.4772	+ 0.34420	+0.1254
				6.054133	0.4416	5.8304
MAR.25 (0H)	X:	+ 4.8433	- 0.26788	+508.7248	+ 2.21895	+2.0245
(2447975.5)				0.495564	4.1950	3.2235
A AVR. 2 (0H)	Y:	- 0.1095	+ 0.04198	+ 22.3735	+ 0.27355	+0.1088
				2.833200	3.6888	5.5509

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 4 DE JUPITER: CALLISTO N=0.3765

		A0	A1	B0 F0	B1 F1	C0 P0
AVR. 1 (OH) (2447982.5)	X:	+ 7.5402	- 0.81440	+492.6265 3.123388	+ 1.14768 0.6033	+1.9816 2.2632
A AVR. 9 (OH)	Y:	- 0.4485	+ 0.04293	+ 23.2549 5.549449	+ 0.40017 0.0013	+0.0972 4.6284
AVR. 9 (OH) (2447990.5)	X:	- 8.6423	+ 3.37805	+471.2396 6.140006	+ 1.20569 5.5916	+1.9977 1.4155
A AVR.17 (OH)	Y:	+ 0.3803	- 0.11663	+ 25.0797 2.362810	+ 0.50560 2.9793	+0.1366 4.0719
AVR.17 (OH) (2447998.5)	X:	+11.0587	- 1.23360	+468.3434 2.835622	+ 1.25343 0.9782	+2.1056 1.6835
A AVR.25 (OH)	Y:	+ 0.0925	- 0.11063	+ 28.9708 5.444211	+ 0.38983 5.7937	+0.1499 4.0362
AVR.25 (OH) (2448006.5)	X:	+13.1561	- 2.19977	+473.3813 5.807857	+ 3.45654 3.3973	+1.6220 1.5300
A MAI 3 (OH)	Y:	- 1.0256	+ 0.18933	+ 32.7074 2.226760	+ 0.38077 2.3799	+0.1142 4.0676
MAI 1 (OH) (2448012.5)	X:	+ 2.2356	+ 0.67324	+458.7114 1.778844	+ 2.18538 5.9740	+1.9567 5.7786
A MAI 9 (OH)	Y:	+ 0.3191	- 0.13360	+ 34.9799 4.531160	+ 0.49720 4.6356	+0.1670 2.2125
MAI 9 (OH) (2448020.5)	X:	+12.5003	- 1.71136	+455.6877 4.771711	+ 3.01609 2.7443	+1.4648 5.2978
A MAI 17 (OH)	Y:	- 1.2065	+ 0.16583	+ 39.1163 1.296496	+ 0.53232 1.2205	+0.1558 1.6773
MAI 17 (OH) (2448028.5)	X:	+ 9.0493	- 1.46856	+435.8472 1.451064	+ 1.46320 4.9356	+1.9670 4.9230
A MAI 25 (OH)	Y:	- 1.1346	+ 0.23902	+ 42.3734 4.284649	+ 0.47608 4.7791	+0.2236 1.3448
MAI 25 (OH) (2448036.5)	X:	- 8.7876	+ 3.33744	+423.3970 4.416355	+ 1.85838 0.8409	+1.9534 5.3105
A JUN. 2 (OH)	Y:	+ 0.7545	- 0.31856	+ 46.6575 1.020804	+ 0.48697 1.4963	+0.2101 1.7662
JUN. 1 (OH) (2448043.5)	X:	- 6.0230	+ 2.56229	+428.7024 0.807674	+ 2.91847 5.7734	+1.2288 4.0178
A JUN. 9 (OH)	Y:	+ 0.4741	- 0.22674	+ 51.1207 3.713903	+ 0.74428 3.5753	+0.1631 0.3839
JUN. 9 (OH) (2448051.5)	X:	+ 0.5987	+ 0.99228	+423.3771 3.747997	+ 1.82586 1.3846	+1.4642 3.5165
A JUN.17 (OH)	Y:	+ 0.2405	- 0.22278	+ 56.4739 0.402268	+ 0.43917 0.3559	+0.2045 0.0620
JUN.17 (OH) (2448059.5)	X:	+ 8.5350	- 0.87944	+417.4310 0.446135	+ 1.39972 4.4528	+1.9647 3.0699
A JUN.25 (OH)	Y:	- 1.2530	+ 0.12842	+ 60.9848 3.410968	+ 0.53979 3.4170	+0.3029 5.9612
JUN.25 (OH) (2448067.5)	X:	+12.3183	- 2.37236	+408.7596 3.464948	+ 2.21184 2.5546	+2.2424 3.0857
A JUL. 3 (OH)	Y:	- 2.0337	+ 0.38810	+ 64.8372 0.168205	+ 0.92545 0.0135	+0.3799 6.0475

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 4 DE JUPITER: CALLISTO N=0.3765

		A0	A1	B0 F0	B1 F1	C0 P0
JUL. 1 (OH)	X:	+10.4210	- 1.53085	+419.6048	+ 2.56284	+1.6668
(2448073.5)				5.668892	3.5718	1.3361
A JUL. 9 (OH)	Y:	- 1.7018	+ 0.23175	+ 70.9602	+ 0.54881	+0.2902
				2.386645	1.9157	4.2145
JUL. 9 (OH)	X:	+ 7.8913	- 1.18742	+404.0505	+ 0.88971	+1.4921
(2448081.5)				2.373177	1.1057	0.8760
A JUL.17 (OH)	Y:	- 1.1333	+ 0.17698	+ 74.0634	+ 0.67175	+0.2903
				5.384990	5.3225	3.8047
JUL.17 (OH)	X:	- 0.6515	+ 0.88004	+403.5797	+ 1.26560	+1.8372
(2448089.5)				5.356277	4.1090	0.4364
A JUL.25 (OH)	Y:	- 0.1098	- 0.12053	+ 79.4020	+ 0.73533	+0.3695
				2.099702	1.8877	3.4112
JUL.25 (OH)	X:	- 4.5417	+ 2.06170	+418.2210	+ 3.09331	+2.2620
(2448097.5)				2.057311	0.2878	0.2045
A AOU. 2 (OH)	Y:	+ 1.4076	- 0.49415	+ 87.8631	+ 0.77056	+0.5004
				5.098918	4.2459	3.2223
AOU. 1 (OH)	X:	- 6.2048	+ 2.50496	+399.0053	+ 0.36781	+2.0958
(2448104.5)				4.637642	0.7237	5.7301
A AOU. 9 (OH)	Y:	+ 1.5738	- 0.60742	+ 88.0476	+ 0.56847	+0.4739
				1.399141	1.7373	2.4654
AOU. 9 (OH)	X:	+ 8.0167	- 0.93880	+404.7347	+ 0.82139	+1.5768
(2448112.5)				1.349482	0.1013	5.0026
A AOU.17 (OH)	Y:	- 1.8860	+ 0.24971	+ 94.4558	+ 0.64711	+0.3839
				4.404869	4.3168	1.7227
AOU.17 (OH)	X:	+10.5710	- 1.86408	+415.1900	+ 2.90629	+1.8635
(2448120.5)				4.359906	3.0868	4.6603
A AOU.25 (OH)	Y:	- 2.6608	+ 0.46640	+101.8278	+ 1.03784	+0.4866
				1.144830	0.5074	1.3991
AOU.25 (OH)	X:	+ 0.6664	+ 0.52457	+414.7561	+ 1.92706	+1.9007
(2448128.5)				1.044917	6.0279	4.6035
A SEP. 2 (OH)	Y:	- 0.5625	- 0.02226	+106.5115	+ 0.73235	+0.5039
				4.113749	3.6636	1.3243
SEP. 1 (OH)	X:	+ 0.8241	+ 0.33619	+415.2437	+ 1.13583	+1.8332
(2448135.5)				3.643747	2.4321	3.6953
A SEP. 9 (OH)	Y:	- 0.3644	- 0.04952	+110.8710	+ 0.71980	+0.5147
				0.443010	0.1246	0.4403
SEP. 9 (OH)	X:	- 8.3912	+ 2.90622	+415.2711	+ 3.40779	+1.1504
(2448143.5)				0.384503	6.0184	3.1452
A SEP.17 (OH)	Y:	+ 2.3264	- 0.81182	+115.0486	+ 1.37461	+0.3282
				3.469996	3.1259	6.1537
SEP.17 (OH)	X:	+ 4.5421	- 0.04131	+426.5610	+ 1.84867	+1.9984
(2448151.5)				3.340219	2.1706	2.8690
A SEP.25 (OH)	Y:	- 1.0607	- 0.04008	+122.7772	+ 0.78826	+0.5902
				0.148001	5.8709	5.9264
SEP.25 (OH)	X:	+10.2502	- 1.87942	+437.1619	+ 1.40740	+2.2895
(2448159.5)				0.023598	4.4225	2.7373
A OCT. 3 (OH)	Y:	- 3.1151	+ 0.55794	+129.7767	+ 0.44877	+0.6835
				3.120849	2.3595	5.8172

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 4 DE JUPITER: CALLISTO N=0.3765

		A0	A1	B0 F0	B1 F1	C0 P0
OCT. 1 (OH)	X:	+ 1.1539	+ 0.83787	+440.4724	+ 2.16506	+2.3943
(2448165.5)				2.287285	1.1258	0.8720
A OCT. 9 (OH)	Y:	- 0.0088	- 0.30521	+133.7652	+ 0.85744	+0.7493
				5.388190	4.6887	3.9490
OCT. 9 (OH)	X:	+11.6674	- 2.33021	+455.8392	+ 2.75633	+1.5241
(2448173.5)				5.278314	3.8296	0.7465
A OCT.17 (OH)	Y:	- 3.4858	+ 0.67951	+141.4352	+ 0.91254	+0.4798
				2.100921	1.1281	3.8080
OCT.17 (OH)	X:	+ 2.4410	- 0.00297	+453.3923	+ 1.36876	+2.1800
(2448181.5)				1.981977	1.2279	0.2351
A OCT.25 (OH)	Y:	- 0.8624	+ 0.05194	+143.7826	+ 0.66909	+0.7019
				5.090575	4.8101	3.3313
OCT.25 (OH)	X:	- 5.7160	+ 1.93951	+452.4552	+ 1.86681	+2.5870
(2448189.5)				4.971889	5.2545	0.0399
A NOV. 2 (OH)	Y:	+ 2.0649	- 0.67976	+146.0857	+ 0.89939	+0.8446
				1.800436	2.1200	3.1439
NOV. 1 (OH)	X:	- 8.6251	+ 2.62496	+481.0082	+ 3.08457	+2.7691
(2448196.5)				1.340182	0.3118	5.4228
A NOV. 9 (OH)	Y:	+ 2.6021	- 0.79836	+157.2999	+ 1.06157	+0.9141
				4.455068	3.6656	2.2486
NOV. 9 (OH)	X:	- 2.1881	+ 1.59774	+480.2099	+ 0.71213	+2.1263
(2448204.5)				4.304172	4.9343	5.2814
A NOV.17 (OH)	Y:	+ 1.0744	- 0.59374	+158.9558	+ 0.41401	+0.7031
				1.138136	1.7730	2.1100
NOV.17 (OH)	X:	+15.2565	- 2.96311	+488.4569	+ 1.70089	+2.6666
(2448212.5)				1.011255	2.4316	4.4284
A NOV.25 (OH)	Y:	- 5.3605	+ 1.03947	+163.0818	+ 0.67112	+0.9021
				4.131045	5.4820	1.2745
NOV.25 (OH)	X:	+ 4.2932	- 0.54979	+505.2059	+ 2.00773	+2.5941
(2448220.5)				4.053994	3.9506	4.5078
A DEC. 3 (OH)	Y:	- 1.1712	+ 0.15326	+169.3000	+ 0.68244	+0.8704
				0.893483	0.9178	1.3377
DEC. 1 (OH)	X:	+ 5.0805	- 0.23303	+514.8192	+ 1.44681	+2.7667
(2448226.5)				0.019233	0.3383	2.6974
A DEC. 9 (OH)	Y:	- 1.8391	+ 0.06684	+172.6925	+ 0.47487	+0.9228
				3.143673	3.6463	5.8341
DEC. 9 (OH)	X:	+18.5575	- 3.99271	+511.8863	+ 4.60038	+3.3268
(2448234.5)				3.064515	3.2762	2.7299
A DEC.17 (OH)	Y:	- 6.1103	+ 1.36919	+171.1898	+ 1.45147	+1.1230
				6.190182	0.1976	5.8572
DEC.17 (OH)	X:	-12.8554	+ 3.72438	+524.1736	+ 4.36110	+2.0551
(2448242.5)				6.081099	0.0295	1.9672
A DEC.25 (OH)	Y:	+ 4.0767	- 1.23427	+174.4606	+ 1.24654	+0.6721
				2.923912	3.2561	5.1135
DEC.25 (OH)	X:	- 0.0841	+ 1.24045	+555.2366	+ 0.59224	+3.0103
(2448250.5)				2.791663	3.0203	1.8669
A DEC.33 (OH)	Y:	+ 0.0845	- 0.36475	+182.9247	+ 0.13265	+0.9996
				5.919228	1.9345	5.0098

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 $C7$ 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 1989.

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 $C7$, 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 1989.

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 1990, 181 jours se sont écoulés, on a donc :

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

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

La formule (3) donne ensuite :

$$\tau = 14.471\,274 - 0.096\,043\,x - 0.442\,994\,x^2 + 0.106\,971\,x^3 + 0.166\,008\,x^4 - 0.061\,105\,x^5 + 0.015\,520\,x^6 + 0.012\,950\,x^7$$

d'où : $= 14.472\,270\,60$

On a d'autre part :

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

La formule (2) donne alors :

$T1 = 102 \times 1{,}769\,860\,5 + 14.472\,270\,60/24 + 0$

$T1 = 181{,}128\,782\,3$ jours depuis le 0 janvier (début de l'intervalle pour les occultations) soit EC.D le 30 juin 1990 à 3 h 5 min 27 s TDT. Le calcul réitéré donne $T2 = 181{,}128\,779\,7$ jours soit le 30 juin 1990 à 3 h 5 min 27 s TDT.

On trouverait de même pour les autres phénomènes :

EC.F	: le 30 juin à 5 h 21 min 23 s
OC.D	: le 30 juin à 2 h 50 min 36 s
OC.F	: le 30 juin à 5 h 06 min 24 s
PA.D	: le 1 juillet à 0 h 06 min 59 s
PA.F	: le 1 juillet à 2 h 23 min 41 s
OM.D	: le 1 juillet à 0 h 21 min 06 s
OM.F	: le 1 juillet à 2 h 37 min 55 s

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 :

OC.D	: le 30 juin à 2 h 50 min 36 s observable
EC.D	: le 30 juin à 3 h 5 min 27 s inobservable car déjà éclipsé
OC.F	: le 30 juin à 5 h 6 min 24 s inobservable car encore occulté
EC.F	: le 30 juin à 5 h 21 min 23 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 1990, 181 days have elapsed

$T = 181$ *and formula (4) gives :*

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

Formula (3) then gives :

$$\tau = 14.471\,274 - 0.096\,043\,x - 0.442\,994\,x^2 + 0.106\,971\,x^3 + 0.166\,008\,x^4 - 0.061\,105\,x^5 + 0.015\,520\,x^6 + 0.012\,950\,x^7$$

therefore $= 14.472\,270\,60$

On the other hand,

K = *integer part of* $(181 - 0)/1.769\,860\,5 = 102$

Formula (2) then gives :

$T1 = 102 \times 1.769\,860\,5 + 14.472\,270\,60/24 + 0$

$T1 = 181.128\,782\,3$ *days from January 0 (beginning of the interval for the occultations) that is June the 30th 1990 at 3 h 5 min 27 s TDT. Another iteration gives* $T2 = 181.128\,779\,7$ *days that is June the 30th 1990 at 3 h 5 min 27 s TDT.*

One would find as well for the other phenomena :

EC.F	: *June the 30th at 5 h 21 min 23 s*
OC.D	: *June the 30th at 2 h 50 min 36 s*
OC.F	: *June the 30th at 5 h 06 min 24 s*
PA.D	: *July the 1st at 0 h 06 min 59 s*
PA.F	: *July the 1st at 2 h 23 min 41 s*
OM.D	: *July the 1st at 0 h 21 min 06 s*
OM.F	: *July the 1st at 2 h 37 min 55 s*

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 :

OC.D	: *June the 30th at 2 h 50 min 36 s observable*
EC.D	: *June the 30th at 3 h 5 min 27 s unobservable as already eclipsed*
OC.F	: *June the 30th at 5 h 6 min 24 s unobservable as yet occulted*
EC.F	: *June the 30th at 5 h 21 min 23 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 1990 SATELLITE 1 P = 1.7698605 JOURS TO = 0.0 DT = 366.JOURS

	EC.D		EC.F		OM.D		OM.F
0	14.471274	0	16.737256	0	35.734120	0	38.014444
1	-0.096043	1	-0.059925	1	0.190572	1	0.231581
2	-0.442994	2	-0.419022	2	-0.480106	2	-0.636850
3	0.106971	3	0.098070	3	-0.123791	3	-0.182756
4	0.166008	4	0.147819	4	0.147900	4	0.383219
5	-0.061105	5	-0.057549	5	-0.131162	5	-0.086777
6	0.015520	6	0.019750	6	0.027202	6	-0.076245
7	0.012950	7	0.011636	7	0.083993	7	0.081289

	OC.D		OC.F		PA.D		PA.F
0	14.254673	0	16.516877	0	35.515297	0	37.792292
1	2.892839	1	2.954998	1	3.204865	1	3.272067
2	-0.006044	2	0.034334	2	-0.029909	2	-0.191742
3	-1.942590	3	-1.988870	3	-2.506492	3	-2.605234
4	0.593794	4	0.551607	4	0.506931	4	0.755788
5	-1.448264	5	-1.424945	5	-0.985656	5	-0.916251
6	-0.341139	6	-0.324471	6	-0.279008	6	-0.387231
7	0.839137	7	0.832477	7	0.676041	7	0.664756

TO = 0 CORRESPOND AU 0 JANVIER 1990 à 0 H SOIT LA DATE JULIENNE 2447891.5

AN 1990 SATELLITE 2 P = 3.5540942 JOURS TO = 0.0 DT = 366.JOURS

	EC.D		EC.F		OM.D		OM.F
0	41.263588	0	44.096327	0	83.783141	0	1.264971
1	0.662075	1	0.757898	1	-0.615072	1	-0.462259
2	-0.701295	2	-0.818957	2	-0.215114	2	-0.311519
3	-0.823903	3	-0.802949	3	0.742716	3	0.647433
4	0.278458	4	0.330976	4	-0.005534	4	0.203893
5	0.256477	5	0.237400	5	-0.433101	5	-0.370996
6	0.011201	6	0.000174	6	0.055459	6	-0.051596
7	-0.029115	7	-0.021451	7	0.128850	7	0.123914

AN 1990 SATELLITE 2 P = 3.5540942 JOURS TO = -1.0 DT = 366.JOURS

	OC.D		OC.F		PA.D		PA.F
0	64.783876	0	67.600837	0	22.030353	0	24.796249
1	6.788897	1	7.000109	1	5.254953	1	5.519378
2	0.246022	2	0.087132	2	0.762197	2	0.683112
3	-5.654483	3	-5.794107	3	-3.191430	3	-3.442768
4	1.228239	4	1.366999	4	0.809432	4	0.983784
5	-1.677764	5	-1.632473	5	-3.206324	5	-3.074951
6	-0.786342	6	-0.826448	6	-0.648484	6	-0.723666
7	1.344617	7	1.341710	7	1.723795	7	1.702918

TO = 0 CORRESPOND AU 0 JANVIER 1990 à 0 H SOIT LA DATE JULIENNE 2447891.5

AN 1990 SATELLITE 3 P = 7.1663872 JOURS TO = 0.0 DT = 366.JOURS

	EC.D		EC.F		OM.D		OM.F
0	52.577992	0	55.944388	0	138.525284	0	141.877105
1	-0.197178	1	0.100831	1	-0.060745	1	0.259322
2	-0.501392	2	-0.563190	2	-0.510915	2	-0.756919
3	-0.004581	3	-0.027137	3	0.011446	3	-0.087958
4	0.148773	4	0.147843	4	0.178841	4	0.500583
5	0.080130	5	0.110349	5	-0.277581	5	-0.216929
6	0.043027	6	0.043702	6	-0.020041	6	-0.165943
7	-0.062104	7	-0.079211	7	0.154122	7	0.156362

	OC.D		OC.F		PA.D		PA.F
0	51.704097	0	55.032823	0	137.653831	0	140.969732
1	11.953253	1	12.491729	1	12.027675	1	12.588821
2	1.223336	2	1.256565	2	1.238148	2	1.086292
3	-8.646816	3	-8.995430	3	-8.848476	3	-9.289434
4	1.942383	4	1.847419	4	1.842983	4	2.057843
5	-5.116283	5	-4.908595	5	-4.960676	5	-4.690857
6	-1.432075	6	-1.382307	6	-1.401229	6	-1.488444
7	3.139600	7	3.065109	7	3.109118	7	3.037432

TO = 0 CORRESPOND AU 0 JANVIER 1990 à 0 H SOIT LA DATE JULIENNE 2447891.5

AN 1990 SATELLITE 4 P = 16.7535520 JOURS TO = 0.0 DT = 366.JOURS

	EC.D		EC.F		OM.D		OM.F
0	385.817213	0	389.678273	0	186.333406	0	190.150907
1	-0.576120	1	0.747263	1	-0.829133	1	0.488542
2	-0.396207	2	-0.934306	2	-0.352315	2	-1.080690
3	-0.073019	3	0.052869	3	0.044917	3	0.026952
4	0.210673	4	0.183092	4	0.089478	4	0.409044
5	-0.114822	5	-0.089039	5	-0.306178	5	-0.143009
6	0.047291	6	-0.035816	6	0.086803	6	-0.159529
7	0.040159	7	0.086820	7	0.108397	7	0.133953

AN 1990 SATELLITE 4 P = 16.7535520 JOURS TO = 10.0 DT = 366.JOURS

	OC.D		OC.F		PA.D		PA.F
0	145.321687	0	149.147122	0	347.912851	0	351.702497
1	27.956935	1	30.426773	1	27.193872	1	29.596001
2	0.865562	2	-0.137772	2	0.553638	2	-0.696988
3	-19.810172	3	-20.958125	3	-19.511115	3	-20.695024
4	0.443453	4	0.679186	4	0.743776	4	1.344720
5	-12.774284	5	-12.091840	5	-12.439464	5	-11.579772
6	-0.432532	6	-0.320592	6	-0.497802	6	-0.529091
7	7.543955	7	7.233039	7	7.333916	7	6.921582

TO = 0 CORRESPOND AU 0 JANVIER 1990 à 0 H SOIT LA DATE JULIENNE 2447891.5

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)*	

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 1 DE SATURNE: MIMAS N=6.667

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
JAN. 1 (OH)	X:	+0.6520	-0.00430	+23.1445	+0.04997	+0.000784	+0.2330
(2447892.5)				2.568025	0.8910	3.3091	0.0268
A JAN. 3 (OH)	Y:	-0.1615	-0.00284	+ 9.4463	+0.03080	+0.001791	+0.0951
				4.355829	2.5046	5.9217	1.8168
JAN. 3 (OH)	X:	+0.6425	-0.00367	+23.1374	+0.05085	+0.002961	+0.2334
(2447894.5)				3.331449	1.8243	6.0314	1.5250
A JAN. 5 (OH)	Y:	-0.1677	-0.00334	+ 9.4302	+0.02686	+0.000570	+0.0949
				5.117739	3.2584	2.8571	3.3098
JAN. 5 (OH)	X:	+0.6345	-0.00508	+23.1383	+0.04641	+0.001946	+0.2334
(2447896.5)				4.094859	2.4768	3.0259	3.0203
A JAN. 7 (OH)	Y:	-0.1741	-0.00320	+ 9.4151	+0.02680	+0.000241	+0.0949
				5.879801	4.0465	3.9197	4.8062
JAN. 7 (OH)	X:	+0.6245	-0.00476	+23.1390	+0.05047	+0.001538	+0.2335
(2447898.5)				4.858400	3.2568	5.2341	4.5183
A JAN. 9 (OH)	Y:	-0.1804	-0.00298	+ 9.4019	+0.02731	+0.000648	+0.0948
				0.358759	4.8088	0.3907	0.0183
JAN. 9 (OH)	X:	+0.6151	-0.00537	+23.1398	+0.04928	+0.000682	+0.2336
(2447900.5)				5.621865	4.1343	1.4512	6.0153
A JAN.11 (OH)	Y:	-0.1862	-0.00317	+ 9.3896	+0.02855	+0.001007	+0.0946
				1.120995	5.6496	2.4306	1.5149
JAN.11 (OH)	X:	+0.6054	-0.00598	+23.1425	+0.05064	+0.002208	+0.2330
(2447902.5)				0.102241	5.0063	2.6356	1.2293
A JAN.13 (OH)	Y:	-0.1929	-0.00262	+ 9.3787	+0.02370	+0.001064	+0.0945
				1.882973	0.2175	5.7269	3.0094
JAN.13 (OH)	X:	+0.5925	-0.00471	+23.1544	+0.03766	+0.004095	+0.2334
(2447904.5)				0.865604	5.6598	5.8418	2.7249
A JAN.15 (OH)	Y:	-0.1986	-0.00284	+ 9.3704	+0.02447	+0.000071	+0.0942
				2.645284	0.9656	2.4330	4.5061
JAN.15 (OH)	X:	+0.5818	-0.00618	+23.1632	+0.04487	+0.001023	+0.2327
(2447906.5)				1.629338	0.1796	2.5003	4.2221
A JAN.17 (OH)	Y:	-0.2036	-0.00322	+ 9.3659	+0.02268	+0.001865	+0.0943
				3.407537	1.5618	2.8413	5.9985
JAN.17 (OH)	X:	+0.5712	-0.00717	+23.1794	+0.04833	+0.004053	+0.2335
(2447908.5)				2.393171	0.7909	2.8627	5.7163
A JAN.19 (OH)	Y:	-0.2099	-0.00240	+ 9.3592	+0.02581	+0.001385	+0.0940
				4.170125	2.5191	5.7969	1.2126
JAN.19 (OH)	X:	+0.5572	-0.00570	+23.1888	+0.04738	+0.003205	+0.2333
(2447910.5)				3.156871	1.8336	5.8937	0.9312
A JAN.21 (OH)	Y:	-0.2154	-0.00249	+ 9.3559	+0.02518	+0.000716	+0.0942
				4.932704	3.2639	6.0639	2.7051
JAN.21 (OH)	X:	+0.5444	-0.00668	+23.2055	+0.04558	+0.000099	+0.2339
(2447912.5)				3.920713	2.5345	1.2226	2.4266
A JAN.23 (OH)	Y:	-0.2203	-0.00283	+ 9.3527	+0.02256	+0.000956	+0.0942
				5.695204	4.1486	2.9538	4.2030
JAN.23 (OH)	X:	+0.5312	-0.00725	+23.2240	+0.04299	+0.001472	+0.2340
(2447914.5)				4.684540	3.3004	3.5821	3.9253
A JAN.25 (OH)	Y:	-0.2257	-0.00237	+ 9.3525	+0.02280	+0.000742	+0.0943
				0.174752	4.8355	6.1653	5.6983
JAN.25 (OH)	X:	+0.5168	-0.00692	+23.2440	+0.04628	+0.001835	+0.2344
(2447916.5)				5.448501	4.0544	5.9469	5.4233
A JAN.27 (OH)	Y:	-0.2304	-0.00253	+ 9.3527	+0.02429	+0.000802	+0.0942
				0.937624	5.6744	1.9990	0.9122

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 1 DE SATURNE: MIMAS N=6.667

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
JAN.27 (OH)	X:	+0.5036	-0.00810	+23.2618	+0.04918	+0.002725	+0.2343
(2447918.5)				6.212461	5.0270	2.4491	0.6370
A JAN.29 (OH)	Y:	-0.2355	-0.00230	+ 9.3546	+0.02245	+0.000154	+0.0943
				1.700421	0.2292	3.4309	2.4097
JAN.29 (OH)	X:	+0.4876	-0.00727	+23.2891	+0.04110	+0.001499	+0.2345
(2447920.5)				0.693202	5.7433	5.7259	2.1361
A JAN.31 (OH)	Y:	-0.2406	-0.00197	+ 9.3571	+0.02122	+0.001086	+0.0941
				2.463311	1.1653	5.7583	3.9048
JAN.31 (OH)	X:	+0.4714	-0.00723	+23.3155	+0.03651	+0.002692	+0.2342
(2447922.5)				1.457140	0.3476	5.9350	3.6308
A FEV. 2 (OH)	Y:	-0.2444	-0.00258	+ 9.3652	+0.01900	+0.001684	+0.0943
				3.226401	1.6925	2.7827	5.4020
FEV. 2 (OH)	X:	+0.4575	-0.00925	+23.3483	+0.04432	+0.004799	+0.2349
(2447924.5)				2.221557	0.8227	2.7800	5.1295
A FEV. 4 (OH)	Y:	-0.2489	-0.00214	+ 9.3717	+0.01922	+0.000263	+0.0941
				3.989602	2.5899	4.0061	0.6134
FEV. 4 (OH)	X:	+0.4405	-0.00824	+23.3782	+0.04155	+0.000696	+0.2348
(2447926.5)				2.985731	1.7743	5.1555	0.3414
A FEV. 6 (OH)	Y:	-0.2537	-0.00161	+ 9.3802	+0.02294	+0.001843	+0.0945
				4.753207	3.3257	5.9514	2.1100
FEV. 6 (OH)	X:	+0.4228	-0.00789	+23.4080	+0.04687	+0.002875	+0.2358
(2447928.5)				3.750143	2.6189	6.0007	1.8399
A FEV. 8 (OH)	Y:	-0.2573	-0.00216	+ 9.3895	+0.01946	+0.000837	+0.0944
				5.516555	4.2683	2.7281	3.6063
FEV. 8 (OH)	X:	+0.4065	-0.00933	+23.4444	+0.03832	+0.002215	+0.2359
(2447930.5)				4.514445	3.3946	3.0495	3.3373
A FEV.10 (OH)	Y:	-0.2612	-0.00189	+ 9.4006	+0.01953	+0.000033	+0.0948
				6.280204	5.0258	3.8721	5.1036
FEV.10 (OH)	X:	+0.3883	-0.00881	+23.4812	+0.04167	+0.001587	+0.2365
(2447932.5)				5.278970	4.1016	5.5094	4.8364
A FEV.12 (OH)	Y:	-0.2650	-0.00167	+ 9.4135	+0.01910	+0.000643	+0.0948
				0.760791	5.7820	0.6488	0.3182
FEV.12 (OH)	X:	+0.3708	-0.00945	+23.5171	+0.04436	+0.001114	+0.2369
(2447934.5)				6.043498	4.9954	1.6948	0.0515
A FEV.14 (OH)	Y:	-0.2683	-0.00181	+ 9.4273	+0.02054	+0.000966	+0.0950
				1.524736	0.3036	2.5773	1.8171
FEV.14 (OH)	X:	+0.3526	-0.00978	+23.5567	+0.04582	+0.001664	+0.2369
(2447936.5)				0.524940	5.8125	2.6474	1.5511
A FEV.16 (OH)	Y:	-0.2722	-0.00126	+ 9.4413	+0.01937	+0.001076	+0.0951
				2.288591	1.3323	5.6023	3.3135
FEV.16 (OH)	X:	+0.3319	-0.00865	+23.6009	+0.03455	+0.003954	+0.2374
(2447938.5)				1.289359	0.4945	5.8299	3.0472
A FEV.18 (OH)	Y:	-0.2750	-0.00155	+ 9.4592	+0.01795	+0.000414	+0.0951
				3.052781	2.0182	2.8548	4.8132
FEV.18 (OH)	X:	+0.3139	-0.01035	+23.6467	+0.03962	+0.002279	+0.2374
(2447940.5)				2.054295	1.0422	2.6915	4.5473
A FEV.20 (OH)	Y:	-0.2774	-0.00173	+ 9.4790	+0.01418	+0.001466	+0.0953
				3.816941	2.8281	2.8880	0.0243
FEV.20 (OH)	X:	+0.2950	-0.01080	+23.6975	+0.03557	+0.003260	+0.2381
(2447942.5)				2.819177	1.7135	2.9330	6.0419
A FEV.22 (OH)	Y:	-0.2809	-0.00086	+ 9.4981	+0.01948	+0.001831	+0.0955
				4.581674	3.5178	5.8684	1.5244

1990 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:	+0.2732	-0.00930	+23.7407	+0.04576	+0.003988	+0.2386
(2447944.5)				3.584195	2.6988	5.8947	1.2593
A FEV.24 (OH)	Y:	-0.2834	-0.00110	+ 9.5196	+0.01752	+0.000393	+0.0957
				5.346286	4.3778	0.2083	3.0192
FEV.24 (OH)	X:	+0.2533	-0.01057	+23.7925	+0.03898	+0.000620	+0.2393
(2447946.5)				4.349223	3.4718	2.7754	2.7557
A FEV.26 (OH)	Y:	-0.2853	-0.00131	+ 9.5406	+0.01868	+0.001017	+0.0961
				6.111043	5.3258	2.8071	4.5196
FEV.26 (OH)	X:	+0.2326	-0.01087	+23.8444	+0.03795	+0.001161	+0.2400
(2447948.5)				5.114321	4.2922	3.6354	4.2563
A FEV.28 (OH)	Y:	-0.2877	-0.00075	+ 9.5651	+0.01616	+0.000815	+0.0964
				0.592814	6.0488	0.0558	6.0174
FEV.28 (OH)	X:	+0.2110	-0.01050	+23.8982	+0.03909	+0.001750	+0.2406
(2447950.5)				5.879586	5.0012	6.2267	5.7556
A MAR. 2 (OH)	Y:	-0.2893	-0.00091	+ 9.5896	+0.01798	+0.000876	+0.0966
				1.358006	0.5243	2.2233	1.2343
MAR. 2 (OH)	X:	+0.1906	-0.01155	+23.9502	+0.04657	+0.002817	+0.2408
(2447952.5)				0.361763	5.8713	2.4578	0.9717
A MAR. 4 (OH)	Y:	-0.2911	-0.00059	+ 9.6150	+0.01828	+0.000301	+0.0969
				2.123192	1.4637	4.4241	2.7339
MAR. 4 (OH)	X:	+0.1673	-0.01052	+24.0096	+0.03782	-0.002084	+0.2416
(2447954.5)				1.126983	0.5200	5.6923	2.4717
A MAR. 6 (OH)	Y:	-0.2928	-0.00033	+ 9.6413	+0.01981	+0.000880	+0.0969
				2.888606	2.3432	5.6683	4.2331
MAR. 6 (OH)	X:	+0.1447	-0.01084	+24.0677	+0.03928	+0.001538	+0.2414
(2447956.5)				1.892424	1.3642	5.9148	3.9697
A MAR. 8 (OH)	Y:	-0.2931	-0.00084	+ 9.6724	+0.01420	+0.001690	+0.0974
				3.654067	3.2101	2.7865	5.7316
MAR. 8 (OH)	X:	+0.1242	-0.01257	+24.1351	+0.03214	+0.005004	+0.2427
(2447958.5)				2.658167	1.8071	2.8163	5.4684
A MAR.10 (OH)	Y:	-0.2943	-0.00018	+ 9.7016	+0.01717	+0.000624	+0.0974
				4.419925	3.9204	5.6334	0.9478
MAR.10 (OH)	X:	+0.1001	-0.01110	+24.1943	+0.04012	+0.002057	+0.2426
(2447960.5)				3.423856	2.7994	5.6708	0.6839
A MAR.12 (OH)	Y:	-0.2954	+0.00021	+ 9.7338	+0.01665	+0.001703	+0.0980
				5.186053	4.5468	6.0464	2.4453
MAR.12 (OH)	X:	+0.0764	-0.01110	+24.2575	+0.04238	+0.002536	+0.2441
(2447962.5)				4.189787	3.5215	6.0270	2.1825
A MAR.14 (OH)	Y:	-0.2951	-0.00032	+ 9.7644	+0.01942	+0.001269	+0.0982
				5.952071	5.5939	2.6623	3.9462
MAR.14 (OH)	X:	+0.0541	-0.01243	+24.3234	+0.03772	+0.002487	+0.2445
(2447964.5)				4.955571	4.5028	2.9955	3.6830
A MAR.16 (OH)	Y:	-0.2953	+0.00016	+ 9.7979	+0.01775	+0.000162	+0.0987
				0.435218	0.0809	0.2959	5.4451
MAR.16 (OH)	X:	+0.0297	-0.01163	+24.3911	+0.03675	+0.001748	+0.2455
(2447966.5)				5.721651	5.1425	5.8311	5.1832
A MAR.18 (OH)	Y:	-0.2950	+0.00037	+ 9.8324	+0.01738	+0.000552	+0.0991
				1.201682	0.8953	0.8979	0.6635
MAR.18 (OH)	X:	+0.0066	-0.01229	+24.4570	+0.04254	+0.001618	+0.2461
(2447968.5)				0.204616	5.9566	1.9237	0.4003
A MAR.20 (OH)	Y:	-0.2943	+0.00031	+ 9.8675	+0.01825	+0.000910	+0.0994
				1.968360	1.6375	2.8397	2.1650

1990 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:	-0.0174	-0.01226	+24.5270	+0.04234	+0.001138	+0.2466
(2447970.5)				0.970815	0.4997	2.8335	1.9021
A MAR.22 (OH)	Y:	-0.2939	+0.00090	+ 9.9021	+0.02214	+0.001206	+0.0997
				2.735087	2.5563	5.5536	3.6648
MAR.22 (OH)	X:	-0.0433	-0.01125	+24.5973	+0.04271	+0.003676	+0.2471
(2447972.5)				1.736906	1.5669	5.7900	3.4000
A MAR.24 (OH)	Y:	-0.2922	+0.00057	+ 9.9411	+0.01885	+0.000692	+0.1001
				3.502009	3.4241	2.7474	5.1674
MAR.24 (OH)	X:	-0.0660	-0.01307	+24.6745	+0.03483	+0.003399	+0.2478
(2447974.5)				2.503498	2.0904	2.7578	4.9022
A MAR.26 (OH)	Y:	-0.2904	+0.00066	+ 9.9799	+0.01938	+0.000935	+0.1002
				4.269026	4.3393	2.8780	0.3821
MAR.26 (OH)	X:	-0.0902	-0.01281	+24.7508	+0.03338	+0.001942	+0.2483
(2447976.5)				3.269995	2.9753	3.0918	0.1156
A MAR.28 (OH)	Y:	-0.2894	+0.00156	+10.0201	+0.01799	+0.002145	+0.1008
				5.036634	4.8324	5.9597	1.8845
MAR.28 (OH)	X:	-0.1167	-0.01135	+24.8222	+0.04440	+0.004626	+0.2496
(2447978.5)				4.036841	3.6103	5.9361	1.6178
A MAR.30 (OH)	Y:	-0.2868	+0.00117	+10.0601	+0.02029	+0.000471	+0.1011
				5.804054	5.7915	1.9841	3.3834
MAR.30 (OH)	X:	-0.1405	-0.01284	+24.9001	+0.03944	+0.001537	+0.2502
(2447980.5)				4.803527	4.6003	2.7126	3.1165
A MAR.32 (OH)	Y:	-0.2840	+0.00120	+10.1002	+0.02232	+0.001044	+0.1018
				0.288590	0.2736	2.7529	4.8858
AVR. 1 (OH)	X:	-0.1654	-0.01266	+24.9770	+0.03977	+0.000686	+0.2515
(2447982.5)				5.570416	5.3793	3.6626	4.6188
A AVR. 3 (OH)	Y:	-0.2815	+0.00184	+10.1432	+0.02047	+0.000882	+0.1022
				1.056375	1.1893	0.0509	0.1042
AVR. 3 (OH)	X:	-0.1906	-0.01223	+25.0559	+0.03815	+0.001613	+0.2523
(2447984.5)				0.054272	6.1145	0.2740	6.1200
A AVR. 5 (OH)	Y:	-0.2779	+0.00167	+10.1860	+0.02054	+0.000940	+0.1027
				1.824467	1.8747	2.5252	1.6072
AVR. 5 (OH)	X:	-0.2147	-0.01303	+25.1331	+0.04430	+0.002887	+0.2528
(2447986.5)				0.821463	0.5460	2.5538	1.3388
A AVR. 7 (OH)	Y:	-0.2746	+0.00212	+10.2284	+0.02371	+0.000594	+0.1031
				2.592586	2.7049	4.9539	3.1095
AVR. 7 (OH)	X:	-0.2412	-0.01173	+25.2133	+0.04498	+0.002723	+0.2538
(2447988.5)				1.588466	1.6120	5.6291	2.8396
A AVR. 9 (OH)	Y:	-0.2707	+0.00231	+10.2725	+0.02469	+0.000685	+0.1033
				3.360929	3.4994	5.7389	4.6129
AVR. 9 (OH)	X:	-0.2659	-0.01234	+25.2947	+0.04390	+0.000350	+0.2539
(2447990.5)				2.355836	2.3466	5.7559	4.3414
A AVR.11 (OH)	Y:	-0.2656	+0.00193	+10.3192	+0.02428	+0.001623	+0.1039
				4.129203	4.5160	2.7166	6.1131
AVR.11 (OH)	X:	-0.2890	-0.01354	+25.3838	+0.03184	+0.004626	+0.2552
(2447992.5)				3.123289	3.2144	2.8405	5.8402
A AVR.13 (OH)	Y:	-0.2615	+0.00281	+10.3652	+0.02282	+0.001257	+0.1042
				4.898056	5.1178	5.9078	1.3339
AVR.13 (OH)	X:	-0.3156	-0.01155	+25.4622	+0.04343	+0.003657	+0.2556
(2447994.5)				3.890974	3.8046	5.8405	1.0596
A AVR.15 (OH)	Y:	-0.2566	+0.00301	+10.4131	+0.02149	+0.001236	+0.1048
				5.666931	5.9427	6.2280	2.8331

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 1 DE SATURNE: MIMAS N=6.667

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
AVR.15 (OH)	X:	-0.3404	-0.01192	+25.5467	+0.04076	+0.001731	+0.2571
(2447996.5)				4.658740	4.6087	6.2398	2.5586
A AVR.17 (OH)	Y:	-0.2504	+0.00254	+10.4580	+0.02681	+0.001737	+0.1053
				0.152735	0.3891	2.6994	4.3379
AVR.17 (OH)	X:	-0.3639	-0.01288	+25.6290	+0.04556	+0.002778	+0.2579
(2447998.5)				5.426439	5.5627	2.8942	4.0622
A AVR.19 (OH)	Y:	-0.2449	+0.00326	+10.5066	+0.02506	+0.000436	+0.1059
				0.921857	1.2843	6.1147	5.8391
AVR.19 (OH)	X:	-0.3891	-0.01167	+25.7150	+0.03886	+0.001947	+0.2591
(2448000.5)				6.194423	0.0262	6.0827	5.5637
A AVR.21 (OH)	Y:	-0.2386	+0.00339	+10.5548	+0.02536	+0.000370	+0.1064
				1.691148	2.0697	1.2238	1.0609
AVR.21 (OH)	X:	-0.4124	-0.01228	+25.7974	+0.04334	+0.002126	+0.2598
(2448002.5)				0.679350	0.7082	2.2007	0.7833
A AVR.23 (OH)	Y:	-0.2318	+0.00342	+10.6033	+0.02539	+0.000760	+0.1069
				2.460618	2.8229	3.2118	2.5649
AVR.23 (OH)	X:	-0.4368	-0.01174	+25.8822	+0.04493	+0.000706	+0.2607
(2448004.5)				1.447433	1.5935	3.7313	2.2868
A AVR.25 (OH)	Y:	-0.2253	+0.00401	+10.6508	+0.02918	+0.001369	+0.1073
				3.230211	3.5534	5.6500	4.0684
AVR.25 (OH)	X:	-0.4617	-0.01082	+25.9645	+0.05271	+0.003369	+0.2610
(2448006.5)				2.215568	2.4846	5.7526	3.7874
A AVR.27 (OH)	Y:	-0.2172	+0.00361	+10.7019	+0.02875	+0.001029	+0.1079
				3.999778	4.5145	2.5543	5.5727
AVR.27 (OH)	X:	-0.4829	-0.01250	+26.0568	+0.03804	+0.004134	+0.2623
(2448008.5)				2.984012	3.3589	2.7546	5.2906
A AVR.29 (OH)	Y:	-0.2093	+0.00398	+10.7515	+0.02968	+0.000368	+0.1080
				4.769617	5.2822	2.6464	0.7920
AVR.29 (OH)	X:	-0.5062	-0.01134	+26.1413	+0.04321	+0.000386	+0.2625
(2448010.5)				3.752489	4.1084	4.3992	0.5075
A AVR.31 (OH)	Y:	-0.2019	+0.00479	+10.8040	+0.02432	+0.002135	+0.1088
				5.539814	6.0475	6.0364	2.2951
MAI 1 (OH)	X:	-0.5303	-0.00999	+26.2254	+0.04160	+0.004685	+0.2642
(2448012.5)				4.521337	4.6538	6.0383	2.0101
A MAI 3 (OH)	Y:	-0.1927	+0.00422	+10.8529	+0.02960	+0.001246	+0.1091
				0.026729	0.4994	2.5380	3.7988
MAI 3 (OH)	X:	-0.5510	-0.01147	+26.3095	+0.04835	+0.002841	+0.2647
(2448014.5)				5.289928	5.6722	2.6708	3.5121
A MAI 5 (OH)	Y:	-0.1836	+0.00450	+10.9032	+0.02921	+0.000826	+0.1100
				0.797082	1.2750	2.9080	5.3019
MAI 5 (OH)	X:	-0.5729	-0.01057	+26.3939	+0.04500	+0.000235	+0.2662
(2448016.5)				6.058809	0.1638	4.1729	5.0152
A MAI 7 (OH)	Y:	-0.1747	+0.00511	+10.9543	+0.03054	+0.000979	+0.1104
				1.567380	2.1677	6.1693	0.5242
MAI 7 (OH)	X:	-0.5941	-0.01004	+26.4780	+0.04313	+0.001287	+0.2670
(2448018.5)				0.544603	0.9574	0.6337	0.2356
A MAI 9 (OH)	Y:	-0.1646	+0.00485	+11.0054	+0.02832	+0.000945	+0.1110
				2.337988	2.9093	2.8026	2.0291
MAI 9 (OH)	X:	-0.6139	-0.01043	+26.5602	+0.04381	+0.002671	+0.2677
(2448020.5)				1.313731	1.6346	2.7521	1.7398
A MAI 11 (OH)	Y:	-0.1550	+0.00538	+11.0546	+0.03134	+0.000966	+0.1115
				3.108629	3.6302	5.3696	3.5339

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 1 DE SATURNE: MIMAS N=6.667

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
MAI 11 (OH)	X:	-0.6355	-0.00877	+26.6397	+0.05499	+0.003542	+0.2686
(2448022.5)				2.082699	2.5628	5.6251	3.2419
A MAI 13 (OH)	Y:	-0.1444	+0.00539	+11.1057	+0.03167	+0.000399	+0.1119
				3.879349	4.4560	0.0743	5.0402
MAI 13 (OH)	X:	-0.6539	-0.00955	+26.7242	+0.04782	+0.000777	+0.2690
(2448024.5)				2.852014	3.3883	2.5703	4.7467
A MAI 15 (OH)	Y:	-0.1330	+0.00513	+11.1564	+0.03502	+0.001580	+0.1124
				4.649999	5.3434	2.6100	0.2593
MAI 15 (OH)	X:	-0.6711	-0.00989	+26.8098	+0.04673	+0.003627	+0.2699
(2448026.5)				3.621276	4.3765	2.7882	6.2464
A MAI 17 (OH)	Y:	-0.1228	+0.00610	+11.2086	+0.02894	+0.001707	+0.1129
				5.421175	6.0971	5.9710	1.7658
MAI 17 (OH)	X:	-0.6911	-0.00745	+26.8868	+0.04329	+0.004900	+0.2708
(2448028.5)				4.390988	4.8276	5.9770	1.4684
A MAI 19 (OH)	Y:	-0.1114	+0.00594	+11.2593	+0.03067	+0.000444	+0.1133
				6.192209	0.6214	0.4770	3.2673
MAI 19 (OH)	X:	-0.7077	-0.00813	+26.9668	+0.04573	+0.000877	+0.2717
(2448030.5)				5.160536	5.7565	1.2719	2.9687
A MAI 21 (OH)	Y:	-0.0990	+0.00555	+11.3074	+0.03186	+0.001960	+0.1141
				0.680324	1.2656	2.8404	4.7737
MAI 21 (OH)	X:	-0.7231	-0.00838	+27.0413	+0.05161	+0.002990	+0.2730
(2448032.5)				5.930167	0.2461	2.8701	4.4740
A MAI 23 (OH)	Y:	-0.0876	+0.00636	+11.3577	+0.03326	+0.000981	+0.1145
				1.451484	2.1915	5.8507	6.2776
MAI 23 (OH)	X:	-0.7395	-0.00676	+27.1198	+0.04572	+0.002078	+0.2738
(2448034.5)				0.416763	1.1606	6.1352	5.9772
A MAI 25 (OH)	Y:	-0.0752	+0.00623	+11.4067	+0.03206	+0.000222	+0.1152
				2.2.2870	2.9599	1.7454	1.5009
MAI 25 (OH)	X:	-0.7531	-0.00722	+27.1927	+0.04387	+0.002389	+0.2746
(2448036.5)				1.186713	1.8058	2.4825	1.1988
A MAI 27 (OH)	Y:	-0.0627	+0.00629	+11.4550	+0.03173	+0.000479	+0.1157
				2.994330	3.7269	3.8004	3.0068
MAI 27 (OH)	X:	-0.7675	-0.00604	+27.2638	+0.05060	+0.001355	+0.2754
(2448038.5)				1.956549	2.6473	5.0511	2.7033
A MAI 29 (OH)	Y:	-0.0504	+0.00672	+11.5018	+0.03265	+0.001358	+0.1161
				3.765896	4.4293	5.8830	4.5129
MAI 29 (OH)	X:	-0.7809	-0.00522	+27.3321	+0.05503	+0.002932	+0.2755
(2448040.5)				2.726538	3 4051	5.8469	4.2068
A MAI 31 (OH)	Y:	-0.0367	+0.00617	+11.5496	+0.03634	+0.001566	+0.1166
				4.537243	5.3498	2.4681	6.0176
MAI 31 (OH)	X:	-0.7903	-0.00650	+27.4084	+0.05070	+0.004557	+0.2767
(2448042.5)				3.496548	4.4946	2.6598	5.7098
A JUN. 2 (OH)	Y:	-0.0239	+0.00670	+11.5963	+0.03375	+0.000137	+0.1168
				5.308965	6.1138	0.0806	1.2406
JUN. 2 (OH)	X:	-0.8021	-0.00440	+27.4731	+0.04822	+0.001803	+0.2766
(2448044.5)				4.266816	5.0934	6.0053	0.9304
A JUN. 4 (OH)	Y:	-0.0112	+0.00717	+11.6446	+0.03083	+0.001713	+0.1175
				6.080708	0.7310	6.0121	2.7432
JUN. 4 (OH)	X:	-0.8128	-0.00333	+27.5402	+0.04057	+0.003700	+0.2781
(2448046.5)				5.037236	5.8791	6.1928	2.4322
A JUN. 6 (OH)	Y:	+0.0029	+0.00636	+11.6870	+0.03245	+0.001952	+0.1178
				0.569379	1.3248	2.8009	4.2501

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 1 DE SATURNE: MIMAS N=6.667

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
JUN. 6 (OH)	X:	-0.8196	-0.00454	+27.5990	+0.05300	+0.004177	+0.2786
(2448048.5)				5.807445	0.3472	2.7444	3.9373
A JUN. 8 (OH)	Y:	+0.0164	+0.00680	+11.7313	+0.03223	+0.000391	+0.1185
				1.341217	2.1835	4.0115	5.7532
JUN. 8 (OH)	X:	-0.8275	-0.00287	+27.6606	+0.04799	+0.000743	+0.2797
(2448050.5)				0.294682	1.2498	5.4622	5.4405
A JUN.10 (OH)	Y:	+0.0297	+0.00712	+11.7735	+0.03431	+0.001150	+0.1190
				2.113000	2.9959	6.0634	0.9775
JUN.10 (OH)	X:	-0.8336	-0.00236	+27.7182	+0.04640	+0.000854	+0.2803
(2448052.5)				1.065153	2.0459	0.9349	0.6627
A JUN.12 (OH)	Y:	+0.0438	+0.00668	+11.8156	+0.03110	+0.000833	+0.1195
				2.884969	3.8179	2.9006	2.4831
JUN.12 (OH)	X:	-0.8381	-0.00222	+27.7725	+0.04403	+0.001843	+0.2809
(2448054.5)				1.835691	2.7933	3.0322	2.1681
A JUN.14 (OH)	Y:	+0.0571	+0.00713	+11.8543	+0.03135	+0.001234	+0.1199
				3.656971	4.4883	5.7107	3.9893
JUN.14 (OH)	X:	-0.8435	-0.00035	+27.8197	+0.05460	+0.004239	+0.2812
(2448056.5)				2.606135	3.4782	5.7480	3.6712
A JUN.16 (OH)	Y:	+0.0713	+0.00678	+11.8935	+0.03317	+0.000595	+0.1203
				4.428825	5.3466	1.7837	5.4962
JUN.16 (OH)	X:	-0.8444	-0.00125	+27.8741	+0.05086	+0.002202	+0.2817
(2448058.5)				3.376700	4.4921	2.3805	5.1770
A JUN.18 (OH)	Y:	+0.0855	+0.00656	+11.9302	+0.03573	+0.001533	+0.1204
				5.200695	6.1330	2.6391	0.7171
JUN.18 (OH)	X:	-0.8450	-0.00065	+27.9217	+0.05468	+0.002562	+0.2817
(2448060.5)				4.147229	5.3205	2.6070	0.3950
A JUN.20 (OH)	Y:	+0.0983	+0.00736	+11.9695	+0.03026	+0.001910	+0.1210
				5.972798	0.7950	5.8614	2.2230
JUN.20 (OH)	X:	-0.8472	+0.00189	+27.9665	+0.03829	+0.005120	+0.2827
(2448062.5)				4.918180	6.0632	6.0553	1.9003
A JUN.22 (OH)	Y:	+0.1123	+0.00670	+12.0030	+0.03130	+0.000598	+0.1210
				0.461622	1.4771	2.8374	3.7269
JUN.22 (OH)	X:	-0.8448	+0.00090	+28.0058	+0.04795	+0.002267	+0.2828
(2448064.5)				5.688794	0.5385	2.5030	3.4024
A JUN.24 (OH)	Y:	+0.1265	+0.00635	+12.0354	+0.02832	+0.001651	+0.1218
				1.233817	2.1991	3.0818	5.2319
JUN.24 (OH)	X:	-0.8418	+0.00140	+28.0407	+0.04711	+0.002584	+0.2840
(2448066.5)				0.176372	1.2867	3.0705	4.9073
A JUN.26 (OH)	Y:	+0.1393	+0.00699	+12.0664	+0.03266	+0.001673	+0.1220
				2.005692	3.0531	5.8672	0.4546
JUN.26 (OH)	X:	-0.8388	+0.00312	+28.0768	+0.04855	+0.002408	+0.2842
(2448068.5)				0.947085	2.2497	6.0407	0.1286
A JUN.28 (OH)	Y:	+0.1529	+0.00647	+12.0962	+0.02956	+0.000336	+0.1225
				2.777764	3.8884	2.0228	1.9602
JUN.28 (OH)	X:	-0.8326	+0.00272	+28.1067	+0.04076	+0.002152	+0.2847
(2448070.5)				1.717948	3.0133	2.6279	1.6338
A JUN.30 (OH)	Y:	+0.1659	+0.00646	+12.1233	+0.02844	+0.000280	+0.1228
				3.549800	4.6504	4.8505	3.4665
JUN.30 (OH)	X:	-0.8274	+0.00435	+28.1299	+0.04710	+0.002529	+0.2850
(2448072.5)				2.488626	3.6703	5.5700	3.1381
A JUL. 2 (OH)	Y:	+0.1786	+0.00652	+12.1484	+0.02722	+0.000941	+0.1230
				4.321820	5.3997	6.2297	4.9733

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 1 DE SATURNE: MIMAS N=6.667

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
JUL. 2 (0H)	X:	-0.8198	+0.00478	+28.1528	+0.04618	+0.001939	+0.2847
(2448074.5)				3.259399	4.4720	6.2579	4.6434
A JUL. 4 (0H)	Y:	+0.1921	+0.00576	+12.1709	+0.03263	+0.002111	+0.1232
				5.093550	6.1962	2.5778	0.1939
JUL. 4 (0H)	X:	-0.8087	+0.00391	+28.1773	+0.05592	+0.005036	+0.2851
(2448076.5)				4.029950	5.4767	2.5810	6.1450
A JUL. 6 (0H)	Y:	+0.2038	+0.00629	+12.1942	+0.02836	+0.000704	+0.1233
				5.865553	0.8218	5.5081	1.7009
JUL. 6 (0H)	X:	-0.8003	+0.00653	+28.1933	+0.04092	+0.002954	+0.2849
(2448078.5)				4.800902	6.2461	6.0268	1.3674
A JUL. 8 (0H)	Y:	+0.2155	+0.00623	+12.2153	+0.02919	+0.001237	+0.1235
				0.354174	1.7024	5.7524	3.2025
JUL. 8 (0H)	X:	-0.7892	+0.00695	+28.2091	+0.04114	+0.001916	+0.2854
(2448080.5)				5.571678	0.8692	0.0034	2.8679
A JUL.10 (0H)	Y:	+0.2282	+0.00519	+12.2311	+0.02360	+0.002149	+0.1238
				1.126233	2.3273	2.9793	4.7093
JUL.10 (0H)	X:	-0.7748	+0.00598	+28.2130	+0.04229	+0.004644	+0.2857
(2448082.5)				0.059190	1.3956	2.9123	4.3737
A JUL.12 (0H)	Y:	+0.2392	+0.00563	+12.2467	+0.02655	+0.000929	+0.1240
				1.897950	3.1949	5.5023	6.2119
JUL.12 (0H)	X:	-0.7619	+0.00797	+28.2211	+0.04512	+0.002019	+0.2860
(2448084.5)				0.829855	2.4081	5.6493	5.8762
A JUL.14 (0H)	Y:	+0.2501	+0.00551	+12.2590	+0.02641	+0.001147	+0.1243
				2.669664	3.9764	6.2473	1.4351
JUL.14 (0H)	X:	-0.7463	+0.00811	+28.2227	+0.04135	+0.000774	+0.2862
(2448086.5)				1.600544	3.2349	1.0648	1.0983
A JUL.16 (0H)	Y:	+0.2610	+0.00489	+12.2704	+0.02496	+0.000803	+0.1244
				3.441359	4.8953	2.7553	2.9402
JUL.16 (0H)	X:	-0.7300	+0.00852	+28.2198	+0.03921	+0.000683	+0.2863
(2448088.5)				2.371159	4.0200	3.4082	2.6030
A JUL.18 (0H)	Y:	+0.2707	+0.00513	+12.2778	+0.02138	+0.001116	+0.1245
				4.213067	5.6125	5.9016	4.4458
JUL.18 (0H)	X:	-0.7140	+0.01008	+28.2093	+0.03779	+0.004008	+0.2857
(2448090.5)				3.141716	4.5746	5.9351	4.1063
A JUL.20 (0H)	Y:	+0.2811	+0.00439	+12.2832	+0.02519	+0.001318	+0.1246
				4.984428	0.0976	2.4132	5.9508
JUL.20 (0H)	X:	-0.6935	+0.00884	+28.2050	+0.04806	+0.003974	+0.2859
(2448092.5)				3.912057	5.6156	2.4349	5.6105
A JUL.22 (0H)	Y:	+0.2905	+0.00421	+12.2861	+0.02450	+0.001194	+0.1243
				5.755859	0.8812	2.9628	1.1722
JUL.22 (0H)	X:	-0.6741	+0.01002	+28.1912	+0.04473	+0.001538	+0.2849
(2448094.5)				4.682485	0.1021	2.5946	0.8295
A JUL.24 (0H)	Y:	+0.2983	+0.00469	+12.2907	+0.02625	+0.002183	+0.1246
				0.243966	1.9541	5.6960	2.6749
JUL.24 (0H)	X:	-0.6555	+0.01202	+28.1798	+0.03851	+0.004629	+0.2856
(2448096.5)				5.453061	1.2447	5.9767	2.3319
A JUL.26 (0H)	Y:	+0.3072	+0.00359	+12.2881	+0.02102	+0.001121	+0.1243
				1.015351	2.6343	3.0747	4.1796
JUL.26 (0H)	X:	-0.6324	+0.01051	+28.1555	+0.03710	+0.003485	+0.2849
(2448098.5)				6.223310	1.7184	2.8499	3.8349
A JUL.28 (0H)	Y:	+0.3152	+0.00331	+12.2852	+0.01947	+0.000924	+0.1246
				1.786638	3.5475	3.3380	5.6812

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 1 DE SATURNE: MIMAS N=6.667

		AO	A1	BO FO	B1 F1	B2 F2	CO PO
JUL.28 (OH) (2448100.5)	X:	-0.6099	+0.01135	+28.1315 0.710415	+0.03603 2.6093	+0.001498 3.6233	+0.2854 5.3371
A JUL.30 (OH)	Y:	+0.3218	+0.00369	+12.2779 2.557598	+0.02176 4.1955	+0.001983 6.0466	+0.1245 0.9035
JUL.30 (OH) (2448102.5)	X:	-0.5873	+0.01258	+28.1052 1.480505	+0.04139 3.4477	+0.002815 6.1165	+0.2851 0.5580
A JUL.32 (OH)	Y:	+0.3288	+0.00287	+12.2704 3.328596	+0.02147 5.1989	+0.000745 2.2293	+0.1246 2.4067
AOU. 1 (OH) (2448104.5)	X:	-0.5622	+0.01197	+28.0750 2.250652	+0.03667 4.4195	+0.001850 2.5317	+0.2849 2.0617
A AOU. 3 (OH)	Y:	+0.3346	+0.00282	+12.2590 4.099509	+0.01907 6.0329	+0.000260 5.1675	+0.1245 3.9113
AOU. 3 (OH) (2448106.5)	X:	-0.5387	+0.01345	+28.0358 3.020604	+0.03084 4.9778.	+0.002985 5.7941	+0.2845 3.5643
A AOU. 5 (OH)	Y:	+0.3401	+0.00253	+12.2454 4.870225	+0.01863 0.5597	+0.000287 0.7067	+0.1243 5.4163
AOU. 5 (OH) (2448108.5)	X:	-0.5125	+0.01307	+27.9999 3.790433	+0.03466 5.8684	+0.001096 1.3510	+0.2838 5.0688
A AOU. 7 (OH)	Y:	+0.3457	+0.00173	+12.2276 5.640703	+0.01929 1.1321	+0.002166 2.7770	+0.1240 0.6350
AOU. 7 (OH) (2448110.5)	X:	-0.4846	+0.01237	+27.9599 4.559975	+0.04382 0.2674	+0.005021 2.6574	+0.2831 0.2852
A AOU. 9 (OH)	Y:	+0.3491	+0.00225	+12.2124 0.127977	+0.02224 2.2386	+0.001561 5.4900	+0.1239 2.1395
AOU. 9 (OH) (2448112.5)	X:	-0.4599	+0.01480	+27.9199 5.329861	+0.03788 1.4888	+0.003910 5.8460	+0.2828 1.7893
A AOU.11 (OH)	Y:	+0.3528	+0.00174	+12.1922 0.898251	+0.02206 3.0173	+0.000952 5.5587	+0.1234 3.6397
AOU.11 (OH) (2448114.5)	X:	-0.4323	+0.01419	+27.8743 6.099367	+0.03882 2.2015	+0.000511 5.7798	+0.2821 3.2880
A AOU.13 (OH)	Y:	+0.3567	+0.00072	+12.1698 1.668719	+0.01783 4.1051	+0.001902 2.9711	+0.1235 5.1430
AOU.13 (OH) (2448116.5)	X:	-0.4029	+0.01321	+27.8202 0.585714	+0.02857 2.9912	+0.004024 3.0556	+0.2822 4.7915
A AOU.15 (OH)	Y:	+0.3587	+0.00120	+12.1444 2.438672	+0.01911 4.6921	+0.001427 5.9259	+0.1230 0.3610
AOU.15 (OH) (2448118.5)	X:	-0.3756	+0.01492	+27.7697 1.354952	+0.03823 3.7440	+0.003069 5.8729	+0.2816 0.0090
A AOU.17 (OH)	Y:	+0.3606	+0.00078	+12.1169 3.208619	+0.01905 5.5732	+0.000831 0.4568	+0.1231 1.8639
AOU.17 (OH) (2448120.5)	X:	-0.3463	+0.01440	+27.7146 2.124199	+0.03713 4.7011	+0.001123 1.4077	+0.2814 1.5120
A AOU.19 (OH)	Y:	+0.3621	+0.00021	+12.0881 3.978392	+0.02109 0.1757	+0.000925 2.8343	+0.1227 3.3666
AOU.19 (OH) (2448122.5)	X:	-0.3176	+0.01468	+27.6546 2.893274	+0.03394 5.5306	+0.000234 4.4715	+0.2808 3.0141
A AOU.21 (OH)	Y:	+0.3624	+0.00031	+12.0564 4.748109	+0.01956 1.1362	+0.000785 5.7688	+0.1224 4.6699
AOU.21 (OH) (2448124.5)	X:	-0.2891	+0.01542	+27.5911 3.662257	+0.02772 0.1146	+0.002735 6.0394	+0.2797 4.5163
A AOU.23 (OH)	Y:	+0.3633	-0.00053	+12.0209 5.517423	+0.01782 1.7137	+0.001665 2.6851	+0.1221 0.0880

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 1 DE SATURNE: MIMAS N=6.667

		AO	A1	BO FO	B1 F1	B2 F2	CO PO
AOU.23 (OH)	X:	-0.2574	+0.01377	+27.5301	+0.03813	+0.005038	+0.2793
(2448126.5)				4.430787	0.5937	2.5963	6.0165
A AOU.25 (OH)	Y:	+0.3627	-0.00050	+11.9857	+0.01925	+0.000627	+0.1214
				0.003545	2.6184	3.8374	1.5912
AOU.25 (OH)	X:	-0.2285	+0.01506	+27.4649	+0.03572	+0.000483	+0.2778
(2448128.5)				5.199522	1.6200	4.3666	1.2350
A AOU.27 (OH)	Y:	+0.3609	-0.00023	+11.9502	+0.02471	+0.002343	+0.1211
				0.772484	3.3484	5.7167	3.0894
AOU.27 (OH)	X:	-0.2003	+0.01606	+27.4038	+0.04614	+0.004361	+0.2778
(2448130.5)				5.968094	2.5604	5.8456	2.7329
A AOU.29 (OH)	Y:	+0.3602	-0.00143	+11.9103	+0.02165	+0.001373	+0.1206
				1.541673	4.4360	2.8866	4.5925
AOU.29 (OH)	X:	-0.1686	+0.01400	+27.3288	+0.03182	+0.003848	+0.2767
(2448132.5)				0.453333	3.4179	2.9481	4.2349
A AOU.31 (OH)	Y:	+0.3582	-0.00145	+11.8701	+0.02343	+0.000304	+0.1203
				2.310485	5.2187	3.2096	6.0899
AOU.31 (OH)	X:	-0.1390	+0.01480	+27.2584	+0.03685	+0.000823	+0.2765
(2448134.5)				1.221599	4.2009	4.7832	5.7332
A SEP. 2 (OH)	Y:	+0.3550	-0.00118	+11.8253	+0.02033	+0.001739	+0.1200
				3.079076	5.9698	6.2336	1.3094
SEP. 2 (OH)	X:	-0.1097	+0.01531	+27.1850	+0.03786	+0.00268	+0.2758
(2448136.5)				1.989630	4.9202	0.0553	0.9519
A SEP. 4 (OH)	Y:	+0.3523	-0.00197	+11.7816	+0.02460	+0.001081	+0.1196
				3.847519	0.4923	2.5428	2.8090
SEP. 4 (OH)	X:	-0.0793	+0.01438	+27.1109	+0.04209	+0.001892	+0.2753
(2448138.5)				2.757630	5.8618	2.5532	2.4524
A SEP. 6 (OH)	Y:	+0.3484	-0.00191	+11.7352	+0.02486	+0.000429	+0.1191
				4.615873	1.4057	4.8265	4.3106
SEP. 6 (OH)	X:	-0.0511	+0.01535	+27.0300	+0.03451	+0.002637	+0.2742
(2448140.5)				3.525487	0.5385	5.7584	3.9524
A SEP. 8 (OH)	Y:	+0.3445	-0.00228	+11.6865	+0.02393	+0.000274	+0.1187
				5.383916	2.1873	2.5569	5.8117
SEP. 8 (OH)	X:	-0.0206	+0.01420	+26.9535	+0.03719	+0.001934	+0.2735
(2448142.5)				4.292995	1.1287	2.3872	5.4538
A SEP.10 (OH)	Y:	+0.3405	-0.00282	+11.6353	+0.02092	+0.001611	+0.1179
				6.151807	3.0037	2.9136	1.0281
SEP.10 (OH)	X:	+0.0095	+0.01361	+26.8723	+0.03365	+0.003957	+0.2719
(2448144.5)				5.060336	1.7843	2.8161	0.6679
A SEP.12 (OH)	Y:	+0.3346	-0.00221	+11.5874	+0.02708	+0.002134	+0.1175
				0.636181	3.6435	5.6543	2.5279
SEP.12 (OH)	X:	+0.0360	+0.01551	+26.7990	+0.04992	+0.004962	+0.2717
(2448146.5)				5.827820	2.7753	5.7705	2.1681
A SEP.14 (OH)	Y:	+0.3294	-0.00286	+11.5350	+0.02599	+0.000413	+0.1166
				1.403734	4.5234	5.7900	4.0263
SEP.14 (OH)	X:	+0.0653	+0.01399	+26.7161	+0.04271	+0.000422	+0.2701
(2448148.5)				0.311787	3.5826	3.4712	3.6650
A SEP.16 (OH)	Y:	+0.3244	-0.00357	+11.4836	+0.03052	+0.001762	+0.1164
				2.171293	5.4583	2.8080	5.5243
SEP.16 (OH)	X:	+0.0947	+0.01301	+26.6318	+0.04288	+0.003234	+0.2702
(2448150.5)				1.078994	4.5866	3.0373	5.1641
A SEP.18 (OH)	Y:	+0.3175	-0.00295	+11.4278	+0.02604	+0.001471	+0.1157
				2.938380	6.2011	6.1093	0.7402

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 1 DE SATURNE: MIMAS N=6.667

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
SEP.18 (OH)	X:	+0.1213	+0.01430	+26.5493	+0.04147	+0.003310	+0.2690
(2448152.5)				1.845768	5.1619	6.0643	0.3794
A SEP.20 (OH)	Y:	+0.3111	-0.00336	+11.3726	+0.02812	+0.000486	+0.1154
				3.705410	0.7219	1.1467	2.2384
SEP.20 (OH)	X:	+0.1493	+0.01328	+26.4660	+0.04692	+0.001377	+0.2686
(2448154.5)				2.612561	6.0377	1.8764	1.8788
A SEP.22 (OH)	Y:	+0.3043	-0.00371	+11.3167	+0.02977	+0.000916	+0.1148
				4.472203	1.4900	3.1591	3.7379
SEP.22 (OH)	X:	+0.1757	+0.01333	+26.3795	+0.04594	+0.000596	+0.2677
(2448156.5)				3.379193	0.6436	4.5329	3.3776
A SEP.24 (OH)	Y:	+0.2968	-0.00356	+11.2595	+0.03134	+0.000689	+0.1142
				5.238882	2.3534	5.5715	5.2375
SEP.24 (OH)	X:	+0.2016	+0.01335	+26.2935	+0.04623	+0.001527	+0.2665
(2448158.5)				4.145668	1.5074	5.9328	4.8775
A SEP.26 (OH)	Y:	+0.2900	-0.00421	+11.1991	+0.02699	+0.001469	+0.1135
				6.005252	3.1797	2.7234	0.4517
SEP.26 (OH)	X:	+0.2295	+0.01159	+26.2066	+0.03716	+0.004875	+0.2657
(2448160.5)				4.911684	2.0563	2.7106	0.0905
A SEP.28 (OH)	Y:	+0.2819	-0.00389	+11.1416	+0.02984	+0.000658	+0.1128
				0.488253	3.8955	5.2219	1.9519
SEP.28 (OH)	X:	+0.2535	+0.01287	+26.1242	+0.04809	+0.001936	+0.2643
(2448162.5)				5.677936	2.9468	5.4723	1.5904
A SEP.30 (OH)	Y:	+0.2732	-0.00369	+11.0828	+0.02960	+0.002006	+0.1121
				1.254083	4.5562	5.8511	3.4462
SEP.30 (OH)	X:	+0.2772	+0.01301	+26.0436	+0.05327	+0.003900	+0.2636
(2448164.5)				0.160686	3.6257	5.8446	3.0841
A OCT. 2 (OH)	Y:	+0.2659	-0.00470	+11.0241	+0.03461	+0.001752	+0.1115
				2.020207	5.5208	2.7085	4.9457
OCT. 2 (OH)	X:	+0.3034	+0.01073	+25.9538	+0.05049	+0.004099	+0.2628
(2448166.5)				0.926722	4.7098	2.8813	4.5838
A OCT. 4 (OH)	Y:	+0.2573	-0.00438	+10.9642	+0.03347	+0.000117	+0.1108
				2.785840	6.2651	2.2328	0.1564
OCT. 4 (OH)	X:	+0.3264	+0.01155	+25.8701	+0.05040	+0.000923	+0.2620
(2448168.5)				1.692422	5.3751	5.6827	6.0784
A OCT. 6 (OH)	Y:	+0.2481	-0.00407	+10.9019	+0.03162	+0.001360	+0.1104
				3.551399	0.8464	6.2593	1.6552
OCT. 6 (OH)	X:	+0.3490	+0.01158	+25.7839	+0.04862	+0.002155	+0.2614
(2448170.5)				2.457965	6.1528	0.2155	1.2943
A OCT. 8 (OH)	Y:	+0.2397	-0.00467	+10.8419	+0.03349	+0.001112	+0.1098
				4.316678	1.5374	2.8344	3.1511
OCT. 8 (OH)	X:	+0.3718	+0.01051	+25.7000	+0.05454	+0.001905	+0.2607
(2448172.5)				3.223458	0.6563	2.8233	2.7914
A OCT.10 (OH)	Y:	+0.2304	-0.00445	+10.7808	+0.03545	+0.000599	+0.1092
				5.081895	2.3750	4.9730	4.6493
OCT.10 (OH)	X:	+0.3923	+0.01108	+25.6129	+0.05548	+0.002340	+0.2595
(2448174.5)				3.988876	1.5967	5.5853	4.2892
A OCT.12 (OH)	Y:	+0.2215	-0.00470	+10.7181	+0.03378	+0.000312	+0.1086
				5.846831	3.1917	2.3891	6.1462
OCT.12 (OH)	X:	+0.4147	+0.00961	+25.5285	+0.04811	+0.002390	+0.2589
(2448176.5)				4.753864	2.2674	2.6052	5.7867
A OCT.14 (OH)	Y:	+0.2126	-0.00490	+10.6556	+0.03317	+0.000960	+0.1077
				0.328465	4.0293	2.8612	1.3603

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 1 DE SATURNE: MIMAS N=6.667

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
OCT.14 (OH)	X:	+0.4355	+0.00928	+25.4431	+0.04583	+0.002445	+0.2572
(2448178.5)				5.518862	3.0954	2.9482	0.9996
A OCT.16 (OH)	Y:	+0.2023	-0.00423	+10.5956	+0.03276	+0.002140	+0.1072
				1.092797	4.6180	5.8012	2.8552
OCT.16 (OH)	X:	+0.4529	+0.01073	+25.3685	+0.05851	+0.005377	+0.2569
(2448180.5)				0.000602	3.6808	5.8091	2.4952
A OCT.18 (OH)	Y:	+0.1933	-0.00484	+10.5341	+0.03477	+0.000313	+0.1063
				1.857333	5.4986	2.1366	4.3520
OCT.18 (OH)	X:	+0.4730	+0.00874	+25.2837	+0.05454	+0.001318	+0.2553
(2448182.5)				0.765446	4.6403	2.7869	3.9912
A OCT.20 (OH)	Y:	+0.1844	-0.00520	+10.4752	+0.03903	+0.001712	+0.1059
				2.621696	6.2562	2.7524	5.8448
OCT.20 (OH)	X:	+0.4922	+0.00797	+25.2033	+0.06086	+0.002859	+0.2553
(2448184.5)				1.530307	5.4795	2.9374	5.4859
A OCT.22 (OH)	Y:	+0.1741	-0.00444	+10.4121	+0.03481	+0.001413	+0.1051
				3.385800	0.8423	6.0721	1.0587
OCT.22 (OH)	X:	+0.5084	+0.00908	+25.1221	+0.05194	+0.003158	+0.2542
(2448186.5)				2.294751	6.2103	6.1297	0.6996
A OCT.24 (OH)	Y:	+0.1646	-0.00478	+10.3517	+0.03626	+0.000252	+0.1047
				4.149783	1.5842	1.8511	2.5524
OCT.24 (OH)	X:	+0.5258	+0.00785	+25.0439	+0.05802	+0.001382	+0.2539
(2448188.5)				3.059261	0.6837	2.3308	2.1956
A OCT.26 (OH)	Y:	+0.1551	-0.00492	+10.2914	+0.03650	+0.000765	+0.1041
				4.913550	2.3398	3.4560	4.0492
OCT.26 (OH)	X:	+0.5413	+0.00782	+24.9644	+0.06012	+0.001075	+0.2530
(2448190.5)				3.823684	1.5364	4.5787	3.6921
A OCT.28 (OH)	Y:	+0.1453	-0.00469	+10.2314	+0.03810	+0.000661	+0.1035
				5.677226	3.1460	5.7663	5.5452
OCT.28 (OH)	X:	+0.5566	+0.00751	+24.8870	+0.05999	+0.000967	+0.2521
(2448192.5)				4.587923	2.3376	5.8031	5.1898
A OCT.30 (OH)	Y:	+0.1362	-0.00510	+10.1697	+0.03600	+0.001185	+0.1028
				0.157557	4.0213	2.5635	0.7567
OCT.30 (OH)	X:	+0.5728	+0.00596	+24.8073	+0.04829	+0.004103	+0.2510
(2448194.5)				5.351870	3.1600	2.7244	0.4003
A OCT.32 (OH)	Y:	+0.1261	-0.00460	+10.1117	+0.03567	+0.000851	+0.1022
				0.920744	4.6925	5.6995	2.2535
NOV. 1 (OH)	X:	+0.5851	+0.00727	+24.7382	+0.05823	+0.002986	+0.2502
(2448196.5)				6.115972	3.7894	5.5904	1.8981
A NOV. 3 (OH)	Y:	+0.1161	-0.00446	+10.0528	+0.03337	+0.001391	+0.1013
				1.683763	5.4438	5.9680	3.7456
NOV. 3 (OH)	X:	+0.5976	+0.00687	+24.6676	+0.05605	+0.002931	+0.2491
(2448198.5)				0.596633	4.5066	5.9230	3.3898
A NOV. 5 (OH)	Y:	+0.1074	-0.00524	+ 9.9973	+0.04010	+0.002013	+0.1010
				2.447020	6.2297	2.7035	5.2413
NOV. 5 (OH)	X:	+0.6120	+0.00472	+24.5942	+0.06547	+0.004497	+0.2488
(2448200.5)				1.360771	5.4821	2.8195	4.8871
A NOV. 7 (OH)	Y:	+0.0976	-0.00469	+ 9.9398	+0.03720	+0.000113	+0.1001
				3.209878	0.7447	5.8152	0.4501
NOV. 7 (OH)	X:	+0.6229	+0.00571	+24.5247	+0.05866	+0.001199	+0.2479
(2448202.5)				2.124484	6.1986	5.8899	0.0966
A NOV. 9 (OH)	Y:	+0.0877	-0.00438	+ 9.8823	+0.03759	+0.001179	+0.0999
				3.972800	1.5998	6.1236	1.9451

1990 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:	+0.6334	+0.00553	+24.4544	+0.05769	+0.001631	+0.2477
(2448204.5)				2.888187	0.7247	0.1932	1.5935
A NOV.11 (OH)	Y:	+0.0787	-0.00485	+ 9.8273	+0.03644	+0.000985	+0.0992
				4.735387	2.2946	3.0143	3.4389
NOV.11 (OH)	X:	+0.6441	+0.00447	+24.3882	+0.06116	+0.001871	+0.2469
(2448206.5)				3.651851	1.4467	3.1156	3.0886
A NOV.13 (OH)	Y:	+0.0691	-0.00454	+ 9.7726	+0.03835	+0.000600	+0.0988
				5.497994	3.0877	5.2916	4.9343
NOV.13 (OH)	X:	+0.6528	+0.00488	+24.3213	+0.06539	+0.002230	+0.2461
(2448208.5)				4.415511	2.3082	5.5249	4.5852
A NOV.15 (OH)	Y:	+0.0601	-0.00468	+ 9.7174	+0.03741	+0.000414	+0.0982
				6.260450	3.9222	1.8453	0.1452
NOV.15 (OH)	X:	+0.6630	+0.00344	+24.2545	+0.05517	+0.002383	+0.2456
(2448210.5)				5.178815	3.1156	2.5769	6.0801
A NOV.17 (OH)	Y:	+0.0511	-0.00468	+ 9.6640	+0.03738	+0.000613	+0.0975
				0.739614	4.7209	2.6307	1.6410
NOV.17 (OH)	X:	+0.6711	+0.00343	+24.1914	+0.05639	+0.001179	+0.2442
(2448212.5)				5.942244	3.9072	3.0201	1.2929
A NOV.19 (OH)	Y:	+0.0412	-0.00405	+ 9.6121	+0.03285	+0.001806	+0.0970
				1.501528	5.3973	5.8640	3.1326
NOV.19 (OH)	X:	+0.6765	+0.00455	+24.1375	+0.05651	+0.005085	+0.2440
(2448214.5)				0.422285	4.4352	5.8635	2.7856
A NOV.21 (OH)	Y:	+0.0327	-0.00462	+ 9.5617	+0.03684	+0.000812	+0.0963
				2.263791	6.2022	2.5460	4.6285
NOV.21 (OH)	X:	+0.6847	+0.00241	+24.0760	+0.06165	+0.002424	+0.2428
(2448216.5)				1.185740	5.4076	2.7037	4.2817
A NOV.23 (OH)	Y:	+0.0242	-0.00473	+ 9.5137	+0.03806	+0.001490	+0.0959
				3.025811	0.6276	2.8185	6.1182
NOV.23 (OH)	X:	+0.6914	+0.00203	+24.0213	+0.06557	+0.002543	+0.2428
(2448218.5)				1.949123	6.1494	2.9157	5.7737
A NOV.25 (OH)	Y:	+0.0147	-0.00396	+ 9.4629	+0.03675	+0.001500	+0.0954
				3.787870	1.5461	5.9579	1.3309
NOV.25 (OH)	X:	+0.6954	+0.00307	+23.9630	+0.05675	+0.003111	+0.2421
(2448220.5)				2.712240	0.7221	6.0830	0.9872
A NOV.27 (OH)	Y:	+0.0062	-0.00429	+ 9.4156	+0.03635	+0.000155	+0.0950
				4.549754	2.2621	2.5490	2.8220
NOV.27 (OH)	X:	+0.7006	+0.00177	+23.9109	+0.06011	+0.001380	+0.2419
(2448222.5)				3.475455	1.4113	2.7110	2.4813
A NOV.29 (OH)	Y:	-0.0022	-0.00434	+ 9.3689	+0.03552	+0.000563	+0.0945
				5.311528	3.0270	3.5699	4.3175
NOV.29 (OH)	X:	+0.7041	+0.00177	+23.8586	+0.06310	+0.001301	+0.2413
(2448224.5)				4.238663	2.2243	4.7090	3.9774
A NOV.31 (OH)	Y:	-0.0107	-0.00408	+ 9.3233	+0.03673	+0.000639	+0.0942
				6.073316	3.8077	6.1443	5.8113
DEC. 1 (OH)	X:	+0.7076	+0.00139	+23.8080	+0.06156	+0.000714	+0.2408
(2448226.5)				5.001733	3.0282	6.0482	5.4737
A DEC. 3 (OH)	Y:	-0.0187	-0.00435	+ 9.2776	+0.03659	+0.001060	+0.0935
				0.551902	4.6731	2.3971	1.0221
DEC. 3 (OH)	X:	+0.7115	+0.00016	+23.7556	+0.05533	+0.003368	+0.2398
(2448228.5)				5.764707	3.9405	2.6687	0.6842
A DEC. 5 (OH)	Y:	-0.0274	-0.00382	+ 9.2350	+0.03324	+0.000833	+0.0932
				1.313324	5.3718	5.7919	2.5167

1990 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:	+0.7117	+0.00149	+23.7158	+0.05597	+0.003470	+0.2396
(2448230.5)				0.244514	4.4788	5.7893	2.1807
A DEC. 7 (OH)	Y:	-0.0358	-0.00378	+ 9.1924	+0.03173	+0.000806	+0.0924
				2.074826	6.1711	5.9923	4.0089
DEC. 7 (OH)	X:	+0.7128	+0.00075	+23.6721	+0.05329	+0.001732	+0.2384
(2448232.5)				1.007454	5.2854	6.0368	3.6728
A DEC. 9 (OH)	Y:	-0.0429	-0.00440	+ 9.1547	+0.03603	+0.002021	+0.0923
				2.836474	0.5517	2.7641	5.5021
DEC. 9 (OH)	X:	+0.7154	-0.00110	+23.6316	+0.06663	+0.004745	+0.2387
(2448234.5)				1.770750	6.0974	2.8106	5.1685
A DEC.11 (OH)	Y:	-0.0512	-0.00376	+ 9.1144	+0.03379	+0.000481	+0.0916
				3.597983	1.4179	5.6296	0.7114
DEC.11 (OH)	X:	+0.7143	+0.00010	+23.5907	+0.05695	+0.001697	+0.2378
(2448236.5)				2.533642	0.6332	5.8652	0.3786
A DEC.13 (OH)	Y:	-0.0593	-0.00353	+ 9.0761	+0.03527	+0.001138	+0.0915
				4.359650	2.2333	6.0173	2.2042
DEC.13 (OH)	X:	+0.7135	-0.00024	+23.5513	+0.05777	+0.001262	+0.2381
(2448238.5)				3.296669	1.4334	0.0399	1.8743
A DEC.15 (OH)	Y:	-0.0666	-0.00396	+ 9.0395	+0.03196	+0.000880	+0.0911
				5.121020	2.9640	3.0277	3.6981
DEC.15 (OH)	X:	+0.7127	-0.00123	+23.5167	+0.05745	+0.001832	+0.2376
(2448240.5)				4.059659	2.1325	3.3016	3.3695
A DEC.17 (OH)	Y:	-0.0743	-0.00362	+ 9.0044	+0.03341	+0.000546	+0.0909
				5.882550	3.7275	5.6935	5.1923
DEC.17 (OH)	X:	+0.7101	-0.00083	+23.4824	+0.06210	+0.002118	+0.2372
(2448242.5)				4.822726	2.9458	5.6102	4.8661
A DEC.19 (OH)	Y:	-0.0814	-0.00371	+ 8.9694	+0.03341	+0.000566	+0.0905
				0.360903	4.5630	1.7030	0.4029
DEC.19 (OH)	X:	+0.7090	-0.00213	+23.4465	+0.05507	+0.002352	+0.2369
(2448244.5)				5.585586	3.8539	2.4672	0.0775
A DEC.21 (OH)	Y:	-0.0886	-0.00363	+ 8.9367	+0.03274	+0.000487	+0.0901
				1.122375	5.3456	2.5449	1.8987
DEC.21 (OH)	X:	+0.7056	-0.00187	+23.4177	+0.05538	+0.000304	+0.2361
(2448246.5)				0.065398	4.5814	3.2613	1.5745
A DEC.23 (OH)	Y:	-0.0964	-0.00312	+ 8.9045	+0.02756	+0.001431	+0.0897
				1.883609	6.1273	5.8317	3.3900
DEC.23 (OH)	X:	+0.7002	-0.00104	+23.3943	+0.04665	+0.004431	+0.2359
(2448248.5)				0.828181	5.1914	5.8962	3.0665
A DEC.25 (OH)	Y:	-0.1029	-0.00368	+ 8.8762	+0.03099	+0.001113	+0.0893
				2.645245	0.5414	2.7127	4.8862
DEC.25 (OH)	X:	+0.6977	-0.00320	+23.3682	+0.05908	+0.003410	+0.2353
(2448250.5)				1.591432	6.0627	2.7220	4.5639
A DEC.27 (OH)	Y:	-0.1095	-0.00363	+ 8.8489	+0.02973	+0.001105	+0.0890
				3.406708	1.2616	2.9462	0.0927
DEC.27 (OH)	X:	+0.6932	-0.00314	+23.3474	+0.05769	+0.001946	+0.2353
(2448252.5)				2.354508	0.5050	2.9926	6.0554
A DEC.29 (OH)	Y:	-0.1169	-0.00292	+ 8.8205	+0.03166	+0.001670	+0.0888
				4.168502	2.1867	5.9069	1.5888
DEC.29 (OH)	X:	+0.6864	-0.00218	+23.3220	+0.05427	+0.003238	+0.2353
(2448254.5)				3.117542	1.4491	6.0156	1.2699
A DEC.31 (OH)	Y:	-0.1233	-0.00331	+ 8.7953	+0.02904	+0.000218	+0.0885
				4.930082	2.9068	2.6891	3.0802

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 1 DE SATURNE : MIMAS N=6.667

		AO	A1	BO FO	B1 F1	B2 F2	CO PO
DEC.30 (OH) (2448255.5)	X:	+0.6838	-0.00281	+23.3129 3.499111	+0.05469 1.7800	+0.001099 6.2451	+0.2355 2.0166
A DEC.32 (OH)	Y:	-0.1264	-0.00345	+ 8.7827 5.310868	+0.02754 3.3095	+0.000868 2.9759	+0.0884 3.8287
DEC.32 (OH) (2448257.5)	X:	+0.6779	-0.00375	+23.2960 4.262199	+0.05246 2.4832	+0.001804 3.3495	+0.2351 3.5127
A DEC.34 (OH)	Y:	-0.1331	-0.00308	+ 8.7593 6.072629	+0.02871 4.0532	+0.000537 5.8991	+0.0883 5.3231

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 2 DE SATURNE: ENCELADE N=4.586

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
JAN. 1 (OH)	X:	+0.1234	+0.00067	+29.6647	+0.08207	+0.000250	+0.0681
(2447892.5)				2.464599	0.8471	3.0356	1.0628
A JAN.17 (OH)	Y:	+0.0531	-0.00027	+12.8384	+0.03202	+0.000127	+0.0293
				4.257087	2.2620	4.8037	2.8588
JAN.17 (OH)	X:	+0.1324	+0.00067	+29.6849	+0.07858	+0.000289	+0.0683
(2447908.5)				0.399362	5.2073	1.0949	3.1600
A FEV. 2 (OH)	Y:	+0.0488	-0.00038	+12.6631	+0.02845	+0.000145	+0.0289
				2.199304	0.3023	2.7724	4.9642
FEV. 1 (OH)	X:	+0.1409	+0.00080	+29.8674	+0.07420	+0.000290	+0.0689
(2447923.5)				0.036384	4.9948	0.7480	2.3824
A FEV.17 (OH)	Y:	+0.0437	-0.00035	+12.5597	+0.02508	+0.000176	+0.0287
				1.843524	0.0654	2.4918	4.1933
FEV.17 (OH)	X:	+0.1535	+0.00058	+30.2324	+0.07044	+0.000335	+0.0699
(2447939.5)				4.260912	3.1095	5.1429	4.4913
A MAR. 5 (OH)	Y:	+0.0385	-0.00035	+12.5184	+0.02123	+0.000195	+0.0287
				6.075289	4.4768	0.4383	0.0254
MAR. 1 (OH)	X:	+0.1600	+0.00089	+30.6161	+0.06800	+0.000422	+0.0708
(2447951.5)				2.720325	1.7021	3.7330	1.3647
A MAR.17 (OH)	Y:	+0.0340	-0.00033	+12.5360	+0.01842	+0.000182	+0.0288
				4.539586	3.1510	5.1574	3.1872
MAR.17 (OH)	X:	+0.1730	+0.00080	+31.2561	+0.06442	+0.000454	+0.0723
(2447967.5)				0.671404	6.1480	1.8135	3.4861
A AVR. 2 (OH)	Y:	+0.0290	-0.00043	+12.6300	+0.01645	+0.000189	+0.0291
				2.496544	1.4676	3.1218	5.3141
AVR. 1 (OH)	X:	+0.1845	+0.00093	+31.9705	+0.06174	+0.000439	+0.0739
(2447982.5)				0.327431	6.0314	1.6918	2.7329
A AVR.17 (OH)	Y:	+0.0231	-0.00047	+12.7933	+0.01661	+0.000199	+0.0295
				2.156928	1.4979	2.7991	4.5650
AVR.17 (OH)	X:	+0.2000	+0.00071	+32.8222	+0.05940	+0.000477	+0.0758
(2447998.5)				4.575315	4.2383	6.1876	4.8691
A MAI 3 (OH)	Y:	+0.0159	-0.00046	+13.0445	+0.01895	+0.000183	+0.0301
				0.124571	6.0949	0.8624	0.4203
MAI 1 (OH)	X:	+0.2100	+0.00091	+33.6045	+0.05643	+0.000435	+0.0775
(2448012.5)				5.942022	5.8447	1.4510	1.2476
A MAI 17 (OH)	Y:	+0.0091	-0.00051	+13.3232	+0.02195	+0.000165	+0.0307
				1.492489	1.3851	2.5099	3.0805
MAI 17 (OH)	X:	+0.2235	+0.00066	+34.4770	+0.05373	+0.000465	+0.0792
(2448028.5)				3.920408	4.0944	6.0975	3.3959
A JUN. 2 (OH)	Y:	+0.0010	-0.00063	+13.6946	+0.02460	+0.000132	+0.0315
				5.753348	5.8260	0.8837	5.2279
JUN. 1 (OH)	X:	+0.2329	+0.00055	+35.2127	+0.04938	+0.000489	+0.0804
(2448043.5)				3.601784	4.0466	6.0906	2.6659
A JUN.17 (OH)	Y:	-0.0079	-0.00069	+14.0669	+0.02586	+0.000126	+0.0322
				5.432301	5.6353	1.3922	4.4932
JUN.17 (OH)	X:	+0.2422	+0.00006	+35.8277	+0.04406	+0.000536	+0.0812
(2448059.5)				1.591127	2.3678	4.5217	4.8191
A JUL. 3 (OH)	Y:	-0.0187	-0.00067	+14.4522	+0.02450	+0.000179	+0.0329
				3.417556	3.7465	0.0281	0.3595

1990 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) (2448073.5)	X:	+0.2436	-0.00001	+36.1664 2.975860	+0.03788 4.0840	+0.000618 6.1679	+0.0812 1.2069
A JUL.17 (OH)	Y:	-0.0286	-0.00065	+14.7432 4.797722	+0.02073 5.2576	+0.000242 1.8024	+0.0334 3.0240
JUL.17 (OH) (2448089.5)	X:	+0.2421	-0.00039	+36.2828 0.968328	+0.03198 2.6060	+0.000662 4.5012	+0.0809 3.3560
A AOU. 2 (OH)	Y:	-0.0390	-0.00070	+14.9794 2.784688	+0.01388 3.4395	+0.000310 0.0038	+0.0336 5.1678
AOU. 1 (OH) (2448104.5)	X:	+0.2351	-0.00057	+36.1142 0.654956	+0.03107 2.9038	+0.000700 4.4699	+0.0799 2.6166
A AOU.17 (OH)	Y:	-0.0490	-0.00061	+15.0800 2.466419	+0.00596 3.6791	+0.000318 6.1251	+0.0336 4.4246
AOU.17 (OH) (2448120.5)	X:	+0.2257	-0.00103	+35.6646 4.923666	+0.03732 1.5050	+0.000663 2.6973	+0.0784 4.7528
A SEP. 2 (OH)	Y:	-0.0583	-0.00049	+15.0429 0.447456	+0.00733 3.4780	+0.000310 4.2491	+0.0332 0.2730
SEP. 1 (OH) (2448135.5)	X:	+0.2112	-0.00105	+35.0370 4.599577	+0.04749 1.5699	+0.000628 2.6319	+0.0765 3.9968
A SEP.17 (OH)	Y:	-0.0651	-0.00042	+14.8796 0.120421	+0.01592 3.5818	+0.000255 4.0175	+0.0326 5.7980
SEP.17 (OH) (2448151.5)	X:	+0.1957	-0.00118	+34.2209 2.570547	+0.05866 6.1205	+0.000556 0.8146	+0.0745 6.1135
A OCT. 3 (OH)	Y:	-0.0720	-0.00019	+14.5915 4.372802	+0.02420 1.7071	+0.000199 2.1713	+0.0318 1.6309
OCT. 1 (OH) (2448165.5)	X:	+0.1782	-0.00088	+33.4532 3.929757	+0.06900 1.3885	+0.000434 2.5295	+0.0726 2.4593
A OCT.17 (OH)	Y:	-0.0750	-0.00019	+14.2673 5.731871	+0.02952 3.1728	+0.000162 3.4720	+0.0310 4.2629
OCT.17 (OH) (2448181.5)	X:	+0.1635	-0.00111	+32.5695 1.885005	+0.07685 5.8040	+0.000372 0.7508	+0.0706 4.5615
A NOV. 2 (OH)	Y:	-0.0775	-0.00012	+13.8500 3.688622	+0.03421 1.2123	+0.000097 1.5337	+0.0300 0.0830
NOV. 1 (OH) (2448196.5)	X:	+0.1475	-0.00091	+31.7943 1.532231	+0.08234 5.6019	+0.000265 0.7169	+0.0689 3.7761
A NOV.17 (OH)	Y:	-0.0787	-0.00010	+13.4380 3.338626	+0.03654 0.9203	+0.000062 1.4455	+0.0290 5.5859
NOV.17 (OH) (2448212.5)	X:	+0.1342	-0.00098	+31.0713 5.757690	+0.08574 3.6783	+0.000237 5.3855	+0.0674 5.8665
A DEC. 3 (OH)	Y:	-0.0802	+0.00005	+13.0010 1.285543	+0.03766 5.2096	+0.000016 0.4937	+0.0280 1.3989
DEC. 1 (OH) (2448226.5)	X:	+0.1196	-0.00059	+30.5459 0.811773	+0.08539 5.1370	+0.000177 0.4367	+0.0664 2.1974
A DEC.17 (OH)	Y:	-0.0798	+0.00002	+12.6362 2.628129	+0.03760 0.3062	+0.000065 2.9828	+0.0272 4.0173
DEC.17 (OH) (2448242.5)	X:	+0.1093	-0.00081	+30.0999 5.030199	+0.08490 3.1971	+0.000190 5.1280	+0.0655 4.2857
A DEC.33 (OH)	Y:	-0.0789	+0.00000	+12.2492 0.570492	+0.03598 4.5777	+0.000099 1.1466	+0.0264 6.1126

1990 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	+36.7042	+0.07208	+0.000385	+0.0030
(2447892.5)				1.635128	6.2781	1.9120	0.0513
A JAN.17 (OH)	Y:	-0.0011	+0.00000	+15.3366	+0.03102	+0.000153	+0.0012
				3.449693	1.2717	3.9227	1.8678
JAN.17 (OH)	X:	+0.0000	+0.00000	+36.7364	+0.06893	+0.000421	+0.0030
(2447908.5)				4.587073	3.1463	5.0422	5.9632
A FEV. 2 (OH)	Y:	-0.0011	+0.00000	+15.0934	+0.02680	+0.000179	+0.0012
				0.123214	4.3400	0.6707	1.4934
FEV. 1 (OH)	X:	+0.0000	+0.00000	+36.9686	+0.06604	+0.000452	+0.0031
(2447923.5)				4.214992	2.9833	4.8279	5.2230
A FEV.17 (OH)	Y:	-0.0011	+0.00000	+14.9404	+0.02232	+0.000201	+0.0012
				6.038651	4.1159	0.3397	0.7551
FEV.17 (OH)	X:	-0.0001	+0.00000	+37.4260	+0.06377	+0.000496	+0.0032
(2447939.5)				0.889486	6.1862	1.6607	4.8587
A MAR. 5 (OH)	Y:	-0.0011	+0.00000	+14.8635	+0.01757	+0.000226	+0.0013
				2.717344	1.0338	3.3235	0.3996
MAR. 1 (OH)	X:	+0.0000	+0.00000	+37.9038	+0.06289	+0.000519	+0.0033
(2447951.5)				3.110851	2.3269	4.0124	3.0076
A MAR.17 (OH)	Y:	-0.0011	+0.00000	+14.8677	+0.01461	+0.000239	+0.0013
				4.941390	3.5519	5.5675	4.8530
MAR.17 (OH)	X:	-0.0001	+0.00000	+38.7032	+0.06333	+0.000563	+0.0034
(2447967.5)				6.077719	5.5744	0.8803	2.6869
A AVR. 2 (OH)	Y:	-0.0011	+0.00000	+14.9607	+0.01328	+0.000254	+0.0013
				1.627755	0.7985	2.2866	4.5127
AVR. 1 (OH)	X:	-0.0001	+0.00000	+39.5956	+0.06542	+0.000590	+0.0036
(2447982.5)				5.723501	5.4911	0.7298	1.9823
A AVR.17 (OH)	Y:	-0.0012	+0.00000	+15.1408	+0.01588	+0.000254	+0.0014
				1.274891	0.9541	1.9953	3.8050
AVR.17 (OH)	X:	+0.0000	+0.00000	+40.6552	+0.06921	+0.000626	+0.0039
(2447998.5)				2.420478	2.4689	3.9640	1.6663
A MAI 3 (OH)	Y:	-0.0012	+0.00000	+15.4308	+0.02127	+0.000244	+0.0015
				4.255010	4.2751	5.0937	3.5007
MAI 1 (OH)	X:	-0.0001	+0.00000	+41.6262	+0.07307	+0.000646	+0.0040
(2448012.5)				5.034251	5.3218	0.5510	0.5908
A MAI 17 (OH)	Y:	-0.0013	+0.00000	+15.7603	+0.02653	+0.000215	+0.0015
				0.584162	0.7907	1.6095	2.4344
MAI 17 (OH)	X:	+0.0000	+0.00000	+42.7114	+0.07738	+0.000683	+0.0042
(2448028.5)				1.745105	2.2948	3.8789	0.3428
A JUN. 2 (OH)	Y:	-0.0014	+0.00000	+16.2042	+0.03173	+0.000176	+0.0016
				3.574950	3.9332	5.0124	2.1592
JUN. 1 (OH)	X:	-0.0001	+0.00000	+43.6245	+0.08012	+0.000713	+0.0043
(2448043.5)				1.416485	2.2110	3.8898	5.9691
A JUN.17 (OH)	Y:	-0.0015	+0.00000	+16.6558	+0.03466	+0.000165	+0.0017
				3.241837	3.7234	5.3360	1.4962
JUN.17 (OH)	X:	-0.0001	+0.00000	+44.3904	+0.08115	+0.000762	+0.0046
(2448059.5)				4.422117	5.4820	0.9970	5.6658
A JUL. 3 (OH)	Y:	-0.0015	+0.00000	+17.1280	+0.03489	+0.000219	+0.0018
				6.241466	0.5767	2.7163	1.2273

1990 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	+44.8146	+0.07969	+0.000797	+0.0044
(2448073.5)				0.771668	2.0771	3.9485	4.6630
A JUL.17 (OH)	Y:	-0.0016	+0.00000	+17.4885	+0.03218	+0.000290	+0.0018
				2.585082	3.3503	5.6961	0.1861
JUL.17 (OH)	X:	-0.0001	+0.00000	+44.9622	+0.07624	+0.000839	+0.0046
(2448089.5)				3.781349	5.3907	1.0285	4.4141
A AOU. 2 (OH)	Y:	-0.0016	+0.00000	+17.7887	+0.02646	+0.000362	+0.0018
				5.587743	0.3067	2.6854	6.2152
AOU. 1 (OH)	X:	-0.0001	+0.00000	+44.7571	+0.07183	+0.000843	+0.0044
(2448104.5)				3.459784	5.3858	0.9997	3.7726
A AOU.17 (OH)	Y:	-0.0016	+0.00000	+17.9262	+0.02006	+0.000387	+0.0018
				5.259825	0.3498	2.5504	5.5572
AOU.17 (OH)	X:	-0.0001	+0.00000	+44.2013	+0.06813	+0.000826	+0.0043
(2448120.5)				0.180398	2.4741	4.2920	3.4680
A SEP. 2 (OH)	Y:	-0.0016	+0.00000	+17.9015	+0.01617	+0.000378	+0.0018
				1.974398	4.0086	5.7340	5.2525
SEP. 1 (OH)	X:	-0.0001	+0.00000	+43.4256	+0.06662	+0.000765	+0.0041
(2448135.5)				6.132218	2.5006	4.2036	2.7985
A SEP.17 (OH)	Y:	-0.0016	+0.00000	+17.7247	+0.01832	+0.000335	+0.0017
				1.638376	4.3304	5.5623	4.5922
SEP.17 (OH)	X:	-0.0001	+0.00000	+42.4192	+0.06783	+0.000683	+0.0039
(2448151.5)				2.839063	5.8519	1.1686	2.4883
A OCT. 3 (OH)	Y:	-0.0015	+0.00000	+17.4005	+0.02412	+0.000272	+0.0016
				4.624747	1.4677	2.4501	4.2589
OCT. 1 (OH)	X:	-0.0001	+0.00000	+41.4646	+0.07014	+0.000597	+0.0037
(2448165.5)				5.448500	2.4577	3.9915	1.4173
A OCT.17 (OH)	Y:	-0.0014	+0.00000	+17.0327	+0.02914	+0.000211	+0.0015
				0.949003	4.3004	5.2251	3.2278
OCT.17 (OH)	X:	-0.0001	+0.00000	+40.3744	+0.07335	+0.000508	+0.0035
(2448181.5)				2.139918	5.7051	0.9525	1.0714
A NOV. 2 (OH)	Y:	-0.0013	+0.00000	+16.5549	+0.03363	+0.000145	+0.0015
				3.922713	1.1627	2.1800	2.8440
NOV. 1 (OH)	X:	-0.0001	+0.00000	+39.4184	+0.07555	+0.000436	+0.0034
(2448196.5)				1.780289	5.5632	0.8476	0.3485
A NOV.17 (OH)	Y:	-0.0013	+0.00000	+16.0828	+0.03611	+0.000095	+0.0014
				3.563567	0.9208	2.1808	2.1281
NOV.17 (OH)	X:	+0.0000	+0.00000	+38.5252	+0.07684	+0.000386	+0.0033
(2448212.5)				4.741731	2.4460	4.1251	6.2788
A DEC. 3 (OH)	Y:	-0.0012	+0.00000	+15.5830	+0.03712	+0.000068	+0.0013
				0.243643	3.9820	5.8714	1.7715
DEC. 1 (OH)	X:	-0.0001	+0.00000	+37.8831	+0.07658	+0.000363	+0.0032
(2448226.5)				1.045841	5.1970	0.6775	5.1575
A DEC.17 (OH)	Y:	-0.0011	+0.00000	+15.1667	+0.03662	+0.000076	+0.0013
				2.833557	0.3590	2.7866	0.6713
DEC.17 (OH)	X:	+0.0000	+0.00000	+37.3331	+0.07519	+0.000360	+0.0031
(2448242.5)				3.999692	2.0494	3.9240	4.7787
A DEC.33 (OH)	Y:	-0.0011	+0.00000	+14.7304	+0.03479	+0.000106	+0.0012
				5.791420	3.3870	6.1328	0.2891

1990 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:	-0.1419	-0.00003	+47.0363	+0.11923	+0.000419	+0.0554
(2447892.5)				3.159180	1.5312	3.3826	4.1885
A JAN.17 (OH)	Y:	+0.0398	-0.00004	+20.3625	+0.04684	+0.000175	+0.0238
				4.951406	2.9301	5.4664	5.9852
JAN.17 (OH)	X:	-0.1426	-0.00010	+47.0694	+0.11627	+0.000454	+0.0556
(2447908.5)				2.156118	0.6809	2.5859	2.1946
A FEV. 2 (OH)	Y:	+0.0390	-0.00002	+20.0861	+0.04234	+0.000214	+0.0235
				3.955813	2.0440	4.5372	3.9981
FEV. 1 (OH)	X:	-0.1442	-0.00014	+47.3596	+0.11258	+0.000507	+0.0560
(2447923.5)				5.144418	3.8197	5.7113	1.8983
A FEV.17 (OH)	Y:	+0.0384	+0.00000	+19.9225	+0.03739	+0.000242	+0.0234
				0.667968	5.1713	1.2630	3.7102
FEV.17 (OH)	X:	-0.1464	-0.00019	+47.9368	+0.10844	+0.000549	+0.0569
(2447939.5)				4.146307	2.9986	4.8870	6.1966
A MAR. 5 (OH)	Y:	+0.0383	+0.00001	+19.8573	+0.03222	+0.000274	+0.0234
				5.960312	4.3745	0.2834	1.7289
MAR. 1 (OH)	X:	-0.1488	-0.00017	+48.5425	+0.10540	+0.000596	+0.0578
(2447951.5)				0.259032	5.5363	1.1509	4.7082
A MAR.17 (OH)	Y:	+0.0384	+0.00003	+19.8874	+0.02889	+0.000293	+0.0235
				2.078076	0.6931	2.7053	0.2483
MAR.17 (OH)	X:	-0.1521	-0.00019	+49.5581	+0.10105	+0.000651	+0.0591
(2447967.5)				5.552750	4.7514	0.3315	2.7343
A AVR. 2 (OH)	Y:	+0.0388	+0.00007	+20.0380	+0.02632	+0.000314	+0.0238
				1.094479	0.0565	1.7481	4.5592
AVR. 1 (OH)	X:	-0.1551	-0.00020	+50.6923	+0.09743	+0.000689	+0.0607
(2447982.5)				2.274682	1.6868	3.5654	2.4564
A AVR.17 (OH)	Y:	+0.0397	+0.00010	+20.2965	+0.02690	+0.000309	+0.0242
				4.103910	3.4368	4.8140	4.2877
AVR.17 (OH)	X:	-0.1583	-0.00019	+52.0418	+0.09350	+0.000749	+0.0625
(2447998.5)				1.298227	0.9531	2.8361	0.4963
A MAI 3 (OH)	Y:	+0.0412	+0.00013	+20.6954	+0.03055	+0.000297	+0.0248
				3.130420	2.8005	3.9637	2.3271
MAI 1 (OH)	X:	-0.1611	-0.00014	+53.2787	+0.08989	+0.000786	+0.0642
(2448012.5)				2.020734	1.9084	3.8141	1.9247
A MAI 17 (OH)	Y:	+0.0429	+0.00016	+21.1389	+0.03490	+0.000256	+0.0255
				3.853970	3.7510	4.8747	3.7600
MAI 17 (OH)	X:	-0.1631	-0.00007	+54.6619	+0.08533	+0.000843	+0.0659
(2448028.5)				1.058254	1.2308	3.1674	6.2639
A JUN. 2 (OH)	Y:	+0.0455	+0.00018	+21.7278	+0.03935	+0.000213	+0.0263
				2.890785	2.9795	4.3596	1.8077
JUN. 1 (OH)	X:	-0.1644	+0.00006	+55.8259	+0.08019	+0.000878	+0.0674
(2448043.5)				4.089157	4.5585	0.2445	6.0105
A JUN.17 (OH)	Y:	+0.0482	+0.00020	+22.3202	+0.04119	+0.000203	+0.0271
				5.919311	6.1584	1.7771	1.5591
JUN.17 (OH)	X:	-0.1638	+0.00018	+56.8015	+0.07417	+0.000935	+0.0688
(2448059.5)				3.138779	3.9598	5.9512	4.0768
A JUL. 3 (OH)	Y:	+0.0514	+0.00021	+22.9323	+0.03962	+0.000286	+0.0278
				4.964875	5.3551	1.4674	5.8970

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 4 DE SATURNE: DIONE N=2.296

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
JUL. 1 (OH)	X:	-0.1615	+0.00029	+57.3414	+0.06848	+0.000972	+0.0693
(2448073.5)				3.881117	5.0533	0.7275	5.5226
A JUL.17 (OH)	Y:	+0.0542	+0.00019	+23.3935	+0.03439	+0.000378	+0.0284
				5.702761	6.2476	2.5277	1.0621
JUL.17 (OH)	X:	-0.1572	+0.00040	+57.5266	+0.06375	+0.001015	+0.0696
(2448089.5)				2.935561	4.5662	0.1340	3.5925
A AOU. 2 (OH)	Y:	+0.0572	+0.00016	+23.7687	+0.02508	+0.000471	+0.0289
				4.751761	5.5577	1.8241	5.4028
AOU. 1 (OH)	X:	-0.1512	+0.00041	+57.2617	+0.06285	+0.001010	+0.0690
(2448104.5)				5.974950	1.7982	3.4767	3.3440
A AOU.17 (OH)	Y:	+0.0595	+0.00011	+23.9271	+0.01552	+0.000498	+0.0290
				1.503025	2.8411	5.0393	5.1553
AOU.17 (OH)	X:	-0.1442	+0.00043	+56.5473	+0.06761	+0.000990	+0.0683
(2448120.5)				5.024351	1.3363	2.8233	1.4028
A SEP. 2 (OH)	Y:	+0.0612	+0.00005	+23.8678	+0.01440	+0.000485	+0.0288
				0.547948	3.0154	4.2661	3.2084
SEP. 1 (OH)	X:	-0.1377	+0.00044	+55.5518	+0.07627	+0.000910	+0.0667
(2448135.5)				1.771484	4.7632	6.1020	1.1456
A SEP.17 (OH)	Y:	+0.0621	+0.00001	+23.6082	+0.02357	+0.000421	+0.0285
				3.575212	0.3891	1.1564	2.9482
SEP.17 (OH)	X:	-0.1309	+0.00041	+54.2603	+0.08779	+0.000814	+0.0652
(2448151.5)				0.807737	4.1337	5.4019	5.4688
A OCT. 3 (OH)	Y:	+0.0622	-0.00003	+23.1516	+0.03468	+0.000338	+0.0278
				2.609738	5.9881	0.3791	0.9901
OCT. 1 (OH)	X:	-0.1252	+0.00033	+53.0350	+0.09751	+0.000711	+0.0636
(2448165.5)				1.528581	5.0905	0.0535	0.6076
A OCT.17 (OH)	Y:	+0.0617	-0.00006	+22.6400	+0.04267	+0.000257	+0.0272
				3.330470	0.5749	1.2496	2.4093
OCT.17 (OH)	X:	-0.1202	+0.00028	+51.6358	+0.10711	+0.000608	+0.0620
(2448181.5)				0.549631	4.3319	5.6216	4.9147
A NOV. 2 (OH)	Y:	+0.0606	-0.00008	+21.9784	+0.04944	+0.000172	+0.0263
				2.353057	6.0007	0.5515	0.4385
NOV. 1 (OH)	X:	-0.1162	+0.00019	+50.4073	+0.11364	+0.000519	+0.0605
(2448196.5)				3.552113	1.2290	2.5664	4.6283
A NOV.17 (OH)	Y:	+0.0592	-0.00010	+21.3245	+0.05305	+0.000107	+0.0255
				5.358506	2.8149	3.8384	0.1543
NOV.17 (OH)	X:	-0.1131	+0.00010	+49.2596	+0.11845	+0.000441	+0.0591
(2448212.5)				2.559828	0.4051	1.8801	2.6401
A DEC. 3 (OH)	Y:	+0.0575	-0.00009	+20.6309	+0.05485	+0.000070	+0.0246
				4.370934	1.9066	3.7378	4.4550
DEC. 1 (OH)	X:	-0.1117	+0.00006	+48.4336	+0.12043	+0.000412	+0.0582
(2448226.5)				3.258214	1.2380	2.8233	4.0392
A DEC.17 (OH)	Y:	+0.0560	-0.00010	+20.0496	+0.05439	+0.000079	+0.0239
				5.074599	2.6713	5.1159	5.8595
DEC.17 (OH)	X:	-0.1107	-0.00001	+47.7258	+0.12092	+0.000397	+0.0575
(2448242.5)				2.257819	0.3864	2.1248	2.0442
A DEC.33 (OH)	Y:	+0.0543	-0.00008	+19.4353	+0.05244	+0.000126	+0.0232
				4.081406	1.7409	4.5183	3.8725

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 5 DE SATURNE: RHEA N=1.391

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
JAN. 1 (OH)	X:	-0.0883	+0.00013	+65.6972	+0.15726	+0.000604	+0.0310
(2447892.5)				1.099396	5.7502	1.2555	0.9957
A JAN.17 (OH)	Y:	-0.0230	-0.00004	+28.7185	+0.06181	+0.000253	+0.0135
				2.885603	0.8403	3.2998	2.7858
JAN.17 (OH)	X:	-0.0861	+0.00012	+65.7420	+0.15431	+0.000644	+0.0308
(2447908.5)				4.467999	2.9958	4.8074	1.4900
A FEV. 2 (OH)	Y:	-0.0239	-0.00004	+28.3389	+0.05581	+0.000295	+0.0132
				6.261918	4.3369	0.4759	3.2872
FEV. 1 (OH)	X:	-0.0844	+0.00008	+66.1451	+0.15085	+0.000694	+0.0307
(2447923.5)				0.166168	5.1359	0.6949	5.4835
A FEV.17 (OH)	Y:	-0.0247	-0.00005	+28.1173	+0.04950	+0.000336	+0.0129
				1.967379	0.1869	2.5193	1.0058
FEV.17 (OH)	X:	-0.0830	+0.00005	+66.9500	+0.14652	+0.000759	+0.0307
(2447939.5)				3.539085	2.4057	4.2486	5.9815
A MAR. 5 (OH)	Y:	-0.0256	-0.00005	+28.0353	+0.04280	+0.000378	+0.0128
				5.347802	3.7762	5.9301	1.5105
MAR. 1 (OH)	X:	-0.0824	+0.00001	+67.7944	+0.14318	+0.000810	+0.0309
(2447951.5)				1.359086	0.3711	2.2262	1.6396
A MAR.17 (OH)	Y:	-0.0263	-0.00005	+28.0846	+0.03861	+0.000404	+0.0127
				3.173025	1.8152	3.7808	3.4586
MAR.17 (OH)	X:	-0.0824	-0.00001	+69.2116	+0.13845	+0.000898	+0.0312
(2447967.5)				4.740191	3.9589	5.8013	2.1461
A AVR. 2 (OH)	Y:	-0.0273	-0.00005	+28.3055	+0.03572	+0.000434	+0.0127
				0.277039	5.5629	0.9168	3.9666
AVR. 1 (OH)	X:	-0.0825	-0.00008	+70.7952	+0.13404	+0.000966	+0.0317
(2447982.5)				0.454293	6.1703	1.7342	6.1519
A AVR.17 (OH)	Y:	-0.0283	-0.00005	+28.6772	+0.03725	+0.000437	+0.0128
				2.278825	1.6525	2.9919	1.6954
AVR.17 (OH)	X:	-0.0840	-0.00009	+72.6789	+0.12938	+0.001056	+0.0321
(2447998.5)				3.848154	3.5280	5.3810	0.3819
A MAI 3 (OH)	Y:	-0.0292	-0.00005	+29.2456	+0.04279	+0.000419	+0.0129
				5.675821	5.3844	0.2264	2.2101
MAI 1 (OH)	X:	-0.0855	-0.00013	+74.4063	+0.12498	+0.001127	+0.0326
(2448012.5)				4.467723	4.3837	6.2451	1.6218
A MAI 17 (OH)	Y:	-0.0300	-0.00005	+29.8743	+0.04921	+0.000369	+0.0131
				0.013348	6.2275	1.0529	3.4502
MAI 17 (OH)	X:	-0.0878	-0.00015	+76.3374	+0.11998	+0.001215	+0.0335
(2448028.5)				1.592469	1.8023	3.6826	2.1419
A JUN. 2 (OH)	Y:	-0.0310	-0.00002	+30.7060	+0.05574	+0.000311	+0.0135
				3.420673	3.5448	4.9141	3.9677
JUN. 1 (OH)	X:	-0.0907	-0.00017	+77.9627	+0.11468	+0.001273	+0.0339
(2448043.5)				3.615745	4.1280	6.0238	6.1697
A JUN.17 (OH)	Y:	-0.0315	-0.00002	+31.5408	+0.05857	+0.000308	+0.0137
				5.441599	5.7201	1.2735	1.7106
JUN.17 (OH)	X:	-0.0934	-0.00015	+79.3260	+0.10897	+0.001346	+0.0346
(2448059.5)				0.753058	1.6183	3.5167	0.4323
A JUL. 3 (OH)	Y:	-0.0320	+0.00002	+32.4006	+0.05689	+0.000419	+0.0143
				2.574857	3.0160	5.3099	2.2500

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 5 DE SATURNE: RHEA N=1.391

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
JUL. 1 (OH)	X:	-0.0961	-0.00009	+80.0806	+0.10402	+0.001366	+0.0350
(2448073.5)				1.393192	2.5997	4.4754	1.6884
A JUL.17 (OH)	Y:	-0.0320	+0.00003	+33.0467	+0.05030	+0.000546	+0.0146
				3.210558	3.8206	6.2665	3.5005
JUL.17 (OH)	X:	-0.0977	-0.00010	+80.3399	+0.10018	+0.001407	+0.0350
(2448089.5)				4.819194	0.1604	1.9795	2.2202
A AOU. 2 (OH)	Y:	-0.0315	+0.00004	+33.5699	+0.03850	+0.000661	+0.0147
				0.347878	1.2424	3.6572	4.0321
AOU. 1 (OH)	X:	-0.0996	+0.00002	+79.9708	+0.09904	+0.001393	+0.0349
(2448104.5)				0.569009	2.6094	4.3212	6.2716
A AOU.17 (OH)	Y:	-0.0310	+0.00006	+33.7873	+0.02714	+0.000699	+0.0149
				2.375891	3.7720	5.8827	1.7930
AOU.17 (OH)	X:	-0.0993	+0.00003	+78.9736	+0.10275	+0.001357	+0.0350
(2448120.5)				3.990722	0.1832	1.7752	0.5254
A SEP. 2 (OH)	Y:	-0.0299	+0.00007	+33.6983	+0.02476	+0.000673	+0.0150
				5.793110	1.7908	3.2029	2.3260
SEP. 1 (OH)	X:	-0.0989	+0.00014	+77.5831	+0.10992	+0.001268	+0.0342
(2448135.5)				6.015282	2.5829	4.0583	4.5604
A SEP.17 (OH)	Y:	-0.0290	+0.00006	+33.3284	+0.03444	+0.000591	+0.0147
				1.531429	4.4282	5.4029	0.0753
SEP.17 (OH)	X:	-0.0967	+0.00015	+75.7791	+0.12067	+0.001147	+0.0336
(2448151.5)				3.141228	0.0518	1.4557	5.0989
A OCT. 3 (OH)	Y:	-0.0279	+0.00006	+32.6821	+0.04771	+0.000478	+0.0145
				4.938879	1.8883	2.7160	0.6135
OCT. 1 (OH)	X:	-0.0944	+0.00019	+74.0675	+0.13026	+0.001026	+0.0329
(2448165.5)				3.761465	0.9246	2.2904	0.0587
A OCT.17 (OH)	Y:	-0.0272	+0.00005	+31.9606	+0.05775	+0.000370	+0.0142
				5.559100	2.6869	3.5125	1.8572
OCT.17 (OH)	X:	-0.0915	+0.00021	+72.1125	+0.14062	+0.000895	+0.0319
(2448181.5)				0.872441	4.5632	5.9488	0.5705
A NOV. 2 (OH)	Y:	-0.0263	+0.00002	+31.0295	+0.06637	+0.000255	+0.0137
				2.671736	6.2271	0.9133	2.3710
NOV. 1 (OH)	X:	-0.0881	+0.00022	+70.3969	+0.14803	+0.000771	+0.0311
(2448196.5)				2.869583	0.4751	1.8903	4.5884
A NOV.17 (OH)	Y:	-0.0260	+0.00002	+30.1109	+0.07101	+0.000172	+0.0132
				4.672025	2.0498	3.2425	0.1107
NOV.17 (OH)	X:	-0.0847	+0.00023	+68.7933	+0.15382	+0.000691	+0.0304
(2448212.5)				6.250258	4.0414	5.5511	5.0899
A DEC. 3 (OH)	Y:	-0.0256	+0.00000	+29.1378	+0.07319	+0.000127	+0.0128
				1.774448	5.5270	1.0294	0.6164
DEC. 1 (OH)	X:	-0.0814	+0.00021	+67.6385	+0.15646	+0.000634	+0.0297
(2448226.5)				0.564656	4.7892	0.0834	0.0299
A DEC.17 (OH)	Y:	-0.0254	+0.00000	+28.3237	+0.07265	+0.000133	+0.0123
				2.377552	6.1998	2.2300	1.8462
DEC.17 (OH)	X:	-0.0778	+0.00021	+66.6478	+0.15752	+0.000601	+0.0290
(2448242.5)				3.936795	2.0415	3.7120	0.5312
A DEC.33 (OH)	Y:	-0.0256	+0.00000	+27.4642	+0.06980	+0.000175	+0.0119
				5.757188	3.3681	6.0151	2.3559

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 6 DE SATURNE: TITAN N=0.394

		A0	A1	B0 F0	B1 F1	C0 P0
JAN. 1 (OH) (2447892.5)	X:	- 8.3166	+ 0.61338	+151.7281 3.243436	+ 0.30351 5.8574	+2.2404 5.6185
A JAN.12 (OH)	Y:	- 2.9590	+ 0.27499	+ 63.3826 5.060905	+ 0.12837 5.8101	+0.8750 1.1217
JAN.12 (OH) (2447903.5)	X:	-10.0998	+ 1.00318	+157.8825 1.316579	+ 1.17185 5.7075	+1.6832 1.9122
A JAN.23 (OH)	Y:	- 1.9325	+ 0.10522	+ 65.0535 3.093887	+ 0.24231 0.6555	+0.7945 3.7484
JAN.23 (OH) (2447914.5)	X:	- 9.8280	+ 1.01666	+147.5470 5.633540	+ 0.97903 5.3305	+2.4790 4.3598
A FEV. 3 (OH)	Y:	- 0.9897	- 0.07672	+ 62.9724 1.128737	+ 0.09615 0.5225	+0.9686 6.1277
FEV. 1 (OH) (2447923.5)	X:	- 1.9390	- 0.50578	+150.6513 2.863208	+ 0.64816 2.4900	+1.9731 4.8653
A FEV.12 (OH)	Y:	- 4.1433	+ 0.41984	+ 60.9570 4.648605	+ 0.28078 5.4433	+0.8570 0.3123
FEV.12 (OH) (2447934.5)	X:	- 4.8847	+ 0.02610	+155.8943 0.880097	+ 0.35463 5.2730	+1.9671 1.1868
A FEV.23 (OH)	Y:	- 4.0167	+ 0.42607	+ 65.2345 2.666371	+ 0.38115 6.0105	+0.7686 3.1012
FEV.23 (OH) (2447945.5)	X:	- 6.7235	+ 0.37728	+153.5604 5.207051	+ 0.65258 4.6914	+2.4540 3.5303
A MAR. 6 (OH)	Y:	- 3.5298	+ 0.34652	+ 63.9426 0.760344	+ 0.38861 5.8325	+1.0590 5.3105
MAR. 1 (OH) (2447951.5)	X:	- 9.9592	+ 1.06091	+162.8476 1.286735	+ 1.11525 5.8525	+1.7373 1.9339
A MAR.12 (OH)	Y:	- 1.7168	+ 0.03943	+ 63.9764 3.088149	+ 0.16457 1.1235	+0.7844 3.7731
MAR.12 (OH) (2447962.5)	X:	- 9.8205	+ 1.07410	+153.7684 5.607073	+ 1.15342 5.4830	+2.6006 4.3999
A MAR.23 (OH)	Y:	- 0.9284	- 0.11531	+ 62.6479 1.120548	+ 0.15692 1.2378	+0.9656 6.1959
MAR.23 (OH) (2447973.5)	X:	- 9.1804	+ 1.01383	+161.2141 3.581905	+ 0.61816 5.6119	+2.4859 0.1538
A AVR. 3 (OH)	Y:	- 0.1271	- 0.28369	+ 65.6793 5.428335	+ 0.19512 2.4664	+1.0238 2.0562
AVR. 1 (OH) (2447982.5)	X:	- 5.4005	+ 0.14915	+165.9115 0.875980	+ 0.29256 5.7050	+2.0733 1.2290
A AVR.12 (OH)	Y:	- 4.0094	+ 0.40346	+ 66.4836 2.677707	+ 0.28016 5.9473	+0.7942 3.1596
AVR.12 (OH) (2447993.5)	X:	- 7.6229	+ 0.54313	+163.4708 5.211695	+ 0.81767 5.1089	+2.6508 3.6168
A AVR.23 (OH)	Y:	- 3.5656	+ 0.33007	+ 66.0299 0.775920	+ 0.36833 6.1302	+1.0954 5.3930
AVR.23 (OH) (2448004.5)	X:	- 9.8150	+ 0.96343	+170.3522 3.206595	+ 0.70778 5.1551	+2.6427 5.7317
A MAI 4 (OH)	Y:	- 2.6438	+ 0.16683	+ 65.6374 5.069866	+ 0.23647 5.8449	+0.9493 1.3039

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 6 DE SATURNE: TITAN N=0.394

		A0	A1	B0 F0	B1 F1	C0 P0
MAI 1 (0H)	X:	+ 1.6786	- 0.94348	+172.6147	+ 0.70469	+2.3234
(2448012.5)				0.076398	2.0049	6.1216
A MAI 12 (0H)	Y:	- 1.4491	- 0.15424	+ 66.5740	+ 0.23118	+0.9751
				1.938749	2.6876	1.6151
MAI 12 (0H)	X:	+ 2.6005	- 1.19952	+182.0289	+ 0.89055	+3.0600
(2448023.5)				4.467820	2.7524	1.9984
A MAI 23 (0H)	Y:	- 2.6511	+ 0.04538	+ 69.0948	+ 0.13293	+1.1084
				0.007177	5.4846	3.8388
MAI 23 (0H)	X:	+ 2.2749	- 1.24088	+172.2151	+ 1.33829	+2.2200
(2448034.5)				2.525899	2.7287	4.2367
A JUN. 3 (0H)	Y:	- 3.9570	+ 0.28028	+ 68.1053	+ 0.38460	+0.9645
				4.323559	5.0772	6.0861
JUN. 1 (0H)	X:	- 4.0215	+ 0.11786	+179.0433	+ 0.59874	+2.6879
(2448043.5)				6.051903	0.5490	5.3605
A JUN.12 (0H)	Y:	+ 0.4994	- 0.48434	+ 68.3067	+ 0.53536	+1.1007
				1.590806	2.4407	0.9766
JUN.12 (0H)	X:	- 0.9836	- 0.48028	+186.3547	+ 0.22672	+2.9900
(2448054.5)				4.126134	1.9509	1.3120
A JUN.23 (0H)	Y:	- 0.0609	- 0.41351	+ 74.2633	+ 0.26699	+1.1914
				5.921246	2.4542	3.0506
JUN.23 (0H)	X:	+ 1.5119	- 1.01792	+178.7808	+ 1.05611	+2.3389
(2448065.5)				2.197275	2.5759	3.5962
A JUL. 4 (0H)	Y:	- 1.3772	- 0.20349	+ 73.8357	+ 0.24708	+0.9092
				4.021297	3.6668	5.5084
JUL. 1 (0H)	X:	-10.6703	+ 1.00565	+179.6247	+ 1.01936	+3.0134
(2448073.5)				5.361383	5.7224	3.9178
A JUL.12 (0H)	Y:	- 3.0488	+ 0.22210	+ 74.7458	+ 0.23460	+1.2222
				0.899618	0.4354	5.6503
JUL.12 (0H)	X:	-12.1016	+ 1.30088	+186.1085	+ 1.37013	+2.9033
(2448084.5)				3.365288	5.5240	6.0049
A JUL.23 (0H)	Y:	- 1.6602	- 0.01376	+ 75.7044	+ 0.20274	+1.1263
				5.217098	0.6160	1.6028
JUL.23 (0H)	X:	-11.2855	+ 1.19264	+192.7243	- 0.36719	+2.0806
(2448095.5)				1.490886	5.5091	2.3758
A AOU. 3 (0H)	Y:	- 0.6681	- 0.21522	+ 76.4707	+ 0.15119	+0.9166
				3.311658	2.3693	4.0992
AOU. 1 (0H)	X:	- 4.8483	- 0.15060	+185.6299	+ 0.10086	+2.9823
(2448104.5)				5.042730	2.9083	3.1579
A AOU.12 (0H)	Y:	- 4.9010	+ 0.51568	+ 77.1828	+ 0.37883	+1.3272
				0.602497	5.7948	4.9794
AOU.12 (0H)	X:	- 8.3203	+ 0.47611	+183.5967	+ 0.75429	+2.6637
(2448115.5)				3.077874	5.2292	5.3972
A AOU.23 (0H)	Y:	- 4.2572	+ 0.44112	+ 73.8040	+ 0.42317	+1.0325
				4.898493	6.0475	0.8568
AOU.23 (0H)	X:	-10.2246	+ 0.83414	+187.0075	+ 0.79915	+2.1179
(2448126.5)				1.174284	5.0123	1.6986
A SEP. 3 (0H)	Y:	- 3.4856	+ 0.31072	+ 77.1588	+ 0.35657	+0.9516
				2.950188	5.9197	3.5761

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 6 DE SATURNE: TITAN N=0.394

		A0	A1	B0 F0	B1 F1	C0 P0
SEP. 1 (OH) (2448135.5)	X:	+ 0.9534	- 1.11355	+185.9639 4.726956	+ 1.04869 2.4061	+3.0533 2.4229
A SEP.12 (OH)	Y:	- 4.0081	+ 0.31265	+ 75.7843 0.263414	+ 0.23449 5.0535	+1.2449 4.2930
SEP.12 (OH) (2448146.5)	X:	- 1.4533	- 0.71900	+173.5804 2.784988	+ 0.38661 3.0043	+2.2146 4.7077
A SEP.23 (OH)	Y:	- 4.5603	+ 0.44825	+ 71.7040 4.560645	+ 0.34973 5.8452	+1.0035 0.1630
SEP.23 (OH) (2448157.5)	X:	- 3.6819	- 0.35582	+174.4834 0.809903	+ 0.68231 3.5976	+2.2878 1.0866
A OCT. 4 (OH)	Y:	- 4.9206	+ 0.53305	+ 75.5913 2.594702	+ 0.58399 5.6959	+0.8857 2.9535
OCT. 1 (OH) (2448165.5)	X:	- 5.2204	+ 0.25233	+172.3638 3.964839	+ 0.59476 0.6689	+2.5918 0.8723
A OCT.12 (OH)	Y:	+ 0.7418	- 0.48405	+ 74.4109 5.748703	+ 0.55004 2.6134	+1.1730 2.6373
OCT.12 (OH) (2448176.5)	X:	- 3.0228	- 0.13556	+167.2848 2.030822	+ 0.30062 0.3215	+2.0700 3.2845
A OCT.23 (OH)	Y:	+ 0.4342	- 0.44017	+ 71.7180 3.859655	+ 0.39946 2.2667	+0.7805 5.1068
OCT.23 (OH) (2448187.5)	X:	- 0.0175	- 0.68953	+165.4297 0.033165	+ 0.72139 2.6529	+2.2461 5.9023
A NOV. 3 (OH)	Y:	- 0.4302	- 0.31271	+ 67.5484 1.860925	+ 0.19136 3.3784	+1.0308 1.4161
NOV. 1 (OH) (2448196.5)	X:	- 9.8083	+ 1.04397	+162.4531 3.561645	+ 0.91064 6.1151	+2.4489 0.0481
A NOV.12 (OH)	Y:	- 0.4179	- 0.21331	+ 69.2192 5.391843	+ 0.34398 2.3612	+1.0391 1.9395
NOV.12 (OH) (2448207.5)	X:	- 8.9166	+ 0.95063	+165.6333 1.649180	+ 1.15166 5.8085	+1.8023 2.6713
A NOV.23 (OH)	Y:	+ 0.3436	- 0.35468	+ 67.0252 3.481975	+ 0.36926 1.8521	+0.7487 4.3698
NOV.23 (OH) (2448218.5)	X:	- 5.9910	+ 0.48079	+155.7713 5.961796	+ 0.30685 5.4272	+2.4151 5.0966
A DEC. 4 (OH)	Y:	+ 0.6477	- 0.43990	+ 62.3935 1.469607	+ 0.25132 2.7648	+0.9777 0.7166
DEC. 1 (OH) (2448226.5)	X:	- 1.7117	- 0.49791	+154.1411 2.819240	+ 0.39364 2.2474	+1.9966 4.8412
A DEC.12 (OH)	Y:	- 4.1343	+ 0.40591	+ 61.4941 4.613094	+ 0.21110 5.8594	+0.8543 0.3021
DEC.12 (OH) (2448237.5)	X:	- 4.4330	- 0.01761	+156.5059 0.836238	+ 0.51392 4.6602	+1.9628 1.1662
A DEC.23 (OH)	Y:	- 4.1693	+ 0.44108	+ 64.5560 2.631969	+ 0.50850 5.9466	+0.7491 3.0904
DEC.23 (OH) (2448248.5)	X:	- 6.2867	+ 0.37404	+151.3207 5.161755	+ 0.46478 4.2946	+2.3903 3.5053
A DEC.34 (OH)	Y:	- 3.4347	+ 0.32752	+ 61.7555 0.724496	+ 0.35111 5.4963	+1.0127 5.2976

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 7 DE SATURNE: HYPERION N=0.394

		A0	A1	B0 F0	B1 F1	C0 P0
JAN. 1 (0H)	X:	-29.6410	+ 7.83995	+155.9382	+ 7.91342	+1.9217
(2447892.5)				4.038606	1.9695	3.0978
A JAN. 9 (0H)	Y:	+ 0.1457	+ 2.16029	+ 64.8472	+ 3.47826	+1.0259
				6.024756	4.1927	5.0478
JAN. 9 (0H)	X:	+50.8831	- 0.26706	+161.7725	+13.65244	+1.0098
(2447900.5)				0.301350	4.6444	4.5221
A JAN.17 (0H)	Y:	+ 2.8690	- 2.03528	+ 63.4498	+ 5.23049	+0.3753
				2.130062	0.2037	0.0759
JAN.17 (0H)	X:	+36.7068	- 8.29745	+134.7131	+ 7.92396	+1.7223
(2447908.5)				2.586732	1.1274	5.9840
A JAN.25 (0H)	Y:	-25.2974	+ 3.50023	+ 58.2458	+ 2.86195	+0.9201
				4.218931	2.4914	1.3473
JAN.25 (0H)	X:	-17.0496	+10.94894	+140.1551	+ 6.82936	+1.4311
(2447916.5)				4.823334	2.6903	5.3840
A FEV. 2 (0H)	Y:	+16.7746	- 1.66152	+ 69.2205	+ 4.31094	+0.3404
				0.362491	4.5145	0.6184
FEV. 1 (0H)	X:	+51.4436	- 0.47970	+156.2864	+13.62523	+0.9446
(2447923.5)				0.752023	5.2311	5.7328
A FEV. 9 (0H)	Y:	+ 1.5198	- 2.31471	+ 58.7643	+ 4.96440	+0.3308
				2.607373	0.8392	1.5032
FEV. 9 (0H)	X:	+11.8232	- 4.58354	+152.4727	+ 8.74736	+2.4675
(2447931.5)				3.012794	1.3998	0.8640
A FEV.17 (0H)	Y:	-21.3743	+ 4.20247	+ 55.0583	+ 2.33017	+0.8668
				4.697975	2.9994	2.4688
FEV.17 (0H)	X:	+13.2311	+ 6.94616	+155.9974	+ 9.98793	+0.6412
(2447939.5)				5.370854	3.3221	0.2011
A FEV.25 (0H)	Y:	+19.2564	- 3.20345	+ 65.8248	+ 4.40741	+0.3454
				0.774381	4.8692	2.8697
FEV.25 (0H)	X:	+70.3287	- 7.04739	+139.5801	+ 9.77610	+0.7737
(2447947.5)				1.346791	6.0300	3.0588
A MAR. 5 (0H)	Y:	- 5.3861	- 2.00733	+ 57.9060	+ 4.75659	+0.2264
				3.358980	1.8014	3.9229
MAR. 1 (0H)	X:	+35.4931	- 8.23229	+141.6642	+ 8.08576	+1.9106
(2447951.5)				2.584032	1.1083	6.1982
A MAR. 9 (0H)	Y:	-23.2635	+ 3.46440	+ 58.1634	+ 2.80292	+0.9212
				4.241503	2.5034	1.5449
MAR. 9 (0H)	X:	-14.9120	+10.85534	+147.9435	+ 7.59076	+1.3385
(2447959.5)				4.846933	2.7284	5.5878
A MAR.17 (0H)	Y:	+18.4626	- 1.98747	+ 69.3561	+ 4.42364	+0.2454
				0.378456	4.5159	1.1056
MAR.17 (0H)	X:	+59.1742	- 2.41289	+157.6200	+13.00565	+0.4620
(2447967.5)				1.019349	5.6065	0.5807
A MAR.25 (0H)	Y:	+ 1.2559	- 2.72223	+ 56.6208	+ 4.78135	+0.3456
				2.965967	1.3610	2.7929
MAR.25 (0H)	X:	- 8.2369	- 0.47881	+172.5128	+ 9.49374	+2.8621
(2447975.5)				3.288716	1.5020	1.5879
A AVR. 2 (0H)	Y:	-15.2451	+ 4.23681	+ 55.9174	+ 2.33117	+0.8613
				5.105093	3.4385	3.5099

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 7 DE SATURNE: HYPERION N=0.394

		A0	A1	B0 F0	B1 F1	C0 P0
AVR. 1 (OH)	X:	+18.7813	+ 6.06682	+169.8532	+11.50274	+0.3972
(2447982.5)				5.423109	3.3887	0.7428
A AVR. 9 (OH)	Y:	+19.0924	- 3.18678	+ 66.9592	+ 4.56246	+0.3378
				0.847104	4.9778	3.2028
AVR. 9 (OH)	X:	+75.9015	- 8.58965	+145.8361	+ 9.26086	+1.1641
(2447990.5)				1.373372	6.0969	3.4100
A AVR.17 (OH)	Y:	- 6.7200	- 1.64441	+ 60.6622	+ 4.72728	+0.1984
				3.391925	1.8488	4.8282
AVR.17 (OH)	X:	-27.6183	+ 5.34701	+181.9622	+ 9.69249	+2.3897
(2447998.5)				3.704781	1.7184	2.5720
A AVR.25 (OH)	Y:	- 4.0837	+ 3.13748	+ 62.5527	+ 3.09235	+0.9899
				5.677408	3.9269	4.6687
AVR.25 (OH)	X:	+47.3738	+ 0.91667	+184.4061	+15.09400	+0.9946
(2448006.5)				6.239900	4.3054	4.1133
A MAI 3 (OH)	Y:	+ 7.8428	- 2.11575	+ 66.6092	+ 5.30594	+0.3278
				1.788092	6.1456	5.9532
MAI 1 (OH)	X:	+79.5131	-11.05158	+144.0557	+ 7.85608	+1.6262
(2448012.5)				1.555719	0.0799	3.8688
A MAI 9 (OH)	Y:	-12.2455	- 0.44637	+ 64.6894	+ 4.54348	+0.3961
				3.522206	1.9476	6.0918
MAI 9 (OH)	X:	-32.4669	+ 7.71024	+185.3676	+ 9.67912	+1.9919
(2448020.5)				3.898586	1.8419	3.1231
A MAI 17 (OH)	Y:	+ 1.1381	+ 2.47301	+ 67.5915	+ 3.54073	+0.9826
				5.902342	4.0913	5.1268
MAI 17 (OH)	X:	+48.2219	+ 1.04798	+186.9647	+15.52182	+0.9928
(2448028.5)				0.195342	4.6103	4.7388
A MAI 25 (OH)	Y:	+ 6.3229	- 2.08371	+ 68.2161	+ 5.54056	+0.3440
				2.025552	0.1636	0.2967
MAI 25 (OH)	X:	+42.4636	- 9.49850	+162.2115	+ 8.73574	+2.1515
(2448036.5)				2.486494	1.0129	6.1811
A JUN. 2 (OH)	Y:	-23.2657	+ 3.53257	+ 66.3057	+ 3.19292	+1.0159
				4.165419	2.4197	1.5493
JUN. 1 (OH)	X:	-31.8928	+12.13348	+175.3870	+ 8.64896	+1.4444
(2448043.5)				4.423705	2.2479	4.8916
A JUN. 9 (OH)	Y:	+14.9862	- 0.34321	+ 77.4050	+ 4.62258	+0.5444
				0.089101	4.3461	6.1727
JUN. 9 (OH)	X:	+53.5229	+ 0.27832	+186.0096	+15.58389	+0.8263
(2448051.5)				0.741022	5.2930	6.0894
A JUN.17 (OH)	Y:	+ 5.0772	- 2.84268	+ 65.5913	+ 5.31327	+0.3122
				2.599816	0.9290	2.1282
JUN.17 (OH)	X:	+ 9.0605	- 4.41493	+187.9484	+10.22624	+3.0124
(2448059.5)				3.033167	1.3625	1.1500
A JUN.25 (OH)	Y:	-20.2785	+ 4.66067	+ 64.9941	+ 2.64032	+0.9461
				4.746263	3.0238	2.8345
JUN.25 (OH)	X:	+22.0757	+ 5.71561	+195.3252	+13.37540	+0.3288
(2448067.5)				5.450586	3.4254	1.2414
A JUL. 3 (OH)	Y:	+20.8192	- 3.39810	+ 77.0210	+ 5.22522	+0.3422
				0.876593	5.0386	3.3587

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 7 DE SATURNE: HYPERION N=0.394

		A0	A1	B0 F0	B1 F1	C0 P0
JUL. 1 (OH)	X:	+61.7810	- 1.87352	+185.0090	+14.68024	+0.3715
(2448073.5)				0.958463	5.5549	0.6563
A JUL. 9 (OH)	Y:	+ 3.9847	- 3.22783	+ 66.3147	+ 5.35221	+0.3560
				2.877676	1.2994	2.9190
JUL. 9 (OH)	X:	- 6.8153	- 1.05177	+198.3656	+10.68366	+3.1330
(2448081.5)				3.265579	1.4713	1.6274
A JUL.17 (OH)	Y:	-16.5209	+ 4.71196	+ 66.7755	+ 2.74420	+0.9709
				5.055569	3.3582	3.5249
JUL.17 (OH)	X:	+35.8312	+ 3.12168	+203.2851	+15.10476	+0.6191
(2448089.5)				5.731042	3.7205	2.9190
A JUL.25 (OH)	Y:	+16.8975	- 3.06152	+ 77.2059	+ 5.46310	+0.2896
				1.191913	5.4260	4.1808
JUL.25 (OH)	X:	+81.0807	-12.16136	+154.3511	+ 7.76710	+1.7802
(2448097.5)				1.683460	0.2175	4.1935
A AOU. 2 (OH)	Y:	-15.5689	+ 0.14377	+ 74.3462	+ 4.82141	+0.6109
				3.581678	1.9666	0.1872
AOU. 1 (OH)	X:	-29.7614	+ 5.82654	+199.4086	+10.46652	+2.3424
(2448104.5)				3.759071	1.7449	2.7324
A AOU. 9 (OH)	Y:	- 3.6900	+ 3.44142	+ 73.0642	+ 3.57948	+1.0762
				5.709008	3.9368	4.7997
AOU. 9 (OH)	X:	+45.4020	+ 1.41608	+196.6174	+15.76922	+0.9333
(2448112.5)				0.040823	4.4117	4.3137
A AOU.17 (OH)	Y:	+ 9.0434	- 2.24797	+ 76.2546	+ 5.98024	+0.3398
				1.841320	6.2176	6.1169
AOU.17 (OH)	X:	+52.3383	-10.66578	+160.3597	+ 8.33802	+1.9126
(2448120.5)				2.340129	0.8743	5.8130
A AOU.25 (OH)	Y:	-24.1538	+ 3.12184	+ 73.2439	+ 3.72647	+1.0524
				4.021931	2.2623	1.2700
AOU.25 (OH)	X:	-26.0084	+11.68706	+172.9559	+ 8.69276	+1.3616
(2448128.5)				4.628282	2.4665	5.3326
A SEP. 2 (OH)	Y:	+18.5948	- 1.16254	+ 83.0882	+ 5.12209	+0.3420
				0.209864	4.4009	0.3402
SEP. 1 (OH)	X:	+48.2235	+ 1.06713	+184.0020	+15.26682	+0.8414
(2448135.5)				0.627347	5.1382	5.7344
A SEP. 9 (OH)	Y:	+ 7.1968	- 2.85674	+ 69.3305	+ 5.47956	+0.2618
				2.439854	0.7044	1.6219
SEP. 9 (OH)	X:	+17.4612	- 5.97838	+175.5771	+ 9.56097	+2.6427
(2448143.5)				2.923935	1.2842	0.9229
A SEP.17 (OH)	Y:	-22.2719	+ 4.49446	+ 67.1543	+ 2.83663	+0.9553
				4.587386	2.8019	2.5012
SEP.17 (OH)	X:	+ 9.4673	+ 6.95485	+178.7179	+11.56860	+0.4729
(2448151.5)				5.311338	3.2688	0.4288
A SEP.25 (OH)	Y:	+21.8828	- 3.07184	+ 77.9112	+ 5.24215	+0.3211
				0.725808	4.8595	3.0859
SEP.25 (OH)	X:	+74.5442	- 7.80681	+156.0406	+ 9.76568	+1.0688
(2448159.5)				1.301363	5.9601	3.5251
A OCT. 3 (OH)	Y:	- 3.1088	- 2.34115	+ 67.1597	+ 5.06903	+0.1807
				3.295419	1.7439	4.8038

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 7 DE SATURNE: HYPERION N=0.394

		A0	A1	B0 F0	B1 F1	C0 P0
OCT. 1 (OH)	X:	+ 1.6736	- 3.03147	+177.6835	+ 9.71977	+2.7574
(2448165.5)				3.150118	1.3989	1.4126
A OCT. 9 (OH)	Y:	-18.7090	+ 4.60649	+ 63.5095	+ 2.58579	+0.8708
				4.873303	3.1086	3.1761
OCT. 9 (OH)	X:	+22.5761	+ 4.40475	+179.1491	+12.90187	+0.3745
(2448173.5)				5.578533	3.5571	2.4430
A OCT.17 (OH)	Y:	+18.6926	- 2.84794	+ 72.8923	+ 5.10640	+0.2994
				1.009374	5.1990	3.8246
OCT.17 (OH)	X:	+75.2286	-10.17241	+141.4676	+ 7.56673	+1.4664
(2448181.5)				1.505603	6.2301	3.9732
A OCT.25 (OH)	Y:	- 9.3423	- 0.94188	+ 66.9594	+ 4.62441	+0.3868
				3.462318	1.8621	6.2082
OCT.25 (OH)	X:	-30.9859	+ 6.35757	+174.4705	+ 9.36914	+1.6662
(2448189.5)				3.861623	1.7906	3.0797
A NOV. 2 (OH)	Y:	- 0.6523	+ 2.88438	+ 66.6823	+ 3.42405	+0.8892
				5.833563	3.9992	5.1129
NOV. 1 (OH)	X:	+35.4797	+ 2.06172	+172.8049	+13.83028	+0.6259
(2448196.5)				6.124959	4.1868	3.9797
A NOV. 9 (OH)	Y:	+11.7854	- 2.13118	+ 67.4851	+ 5.23083	+0.2934
				1.626481	5.9626	5.6795
NOV. 9 (OH)	X:	+56.6180	-10.57494	+135.2978	+ 6.77707	+1.5517
(2448204.5)				2.086315	0.6209	5.3434
A NOV.17 (OH)	Y:	-18.9346	+ 1.92325	+ 65.2253	+ 3.62538	+0.8732
				3.837102	2.0847	1.0090
NOV.17 (OH)	X:	-31.9437	+10.18651	+155.1439	+ 8.16387	+1.0260
(2448212.5)				4.353935	2.1632	4.9326
A NOV.25 (OH)	Y:	+12.7362	+ 0.24167	+ 70.3365	+ 4.27041	+0.4264
				0.024721	4.2714	6.1218
NOV.25 (OH)	X:	+43.9319	+ 0.82831	+158.4974	+13.20794	+0.6290
(2448220.5)				0.657427	5.2042	5.9721
A DEC. 3 (OH)	Y:	+ 8.9398	- 2.90965	+ 56.7441	+ 4.45684	+0.2241
				2.497710	0.8229	2.2043
DEC. 1 (OH)	X:	+43.9291	- 9.42963	+136.8648	+ 7.06507	+1.6994
(2448226.5)				2.324390	0.8250	6.0450
A DEC. 9 (OH)	Y:	-19.1615	+ 2.60605	+ 61.3831	+ 3.16311	+0.8958
				4.024790	2.2264	1.4732
DEC. 9 (OH)	X:	-24.7238	+ 9.99009	+148.2931	+ 8.12966	+0.9719
(2448234.5)				4.595009	2.4366	5.5953
A DEC.17 (OH)	Y:	+17.0846	- 0.92866	+ 68.6339	+ 4.45927	+0.1539
				0.195458	4.3699	0.7603
DEC.17 (OH)	X:	+49.6346	- 0.81408	+152.5399	+12.20712	+0.2468
(2448242.5)				0.811972	5.4022	0.3694
A DEC.25 (OH)	Y:	+ 8.1551	- 3.10340	+ 52.6675	+ 4.13260	+0.2591
				2.726008	1.1490	2.9829
DEC.25 (OH)	X:	- 0.8840	- 2.80390	+159.4881	+ 8.82379	+2.4566
(2448250.5)				3.113096	1.3338	1.5462
A DEC.33 (OH)	Y:	-14.5979	+ 3.98660	+ 53.5088	+ 2.19991	+0.7182
				4.860605	3.0430	3.3934

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 8 DE SATURNE: JAPET N=0.079

		A0	A1	B0 F0	C0 P0
JAN. 1 (0H) (2447892.5)	X:	-58.5291	+ 3.53822	+393.6536 4.710398	+ 1.7099 0.4971
A JAN.17 (0H)	Y:	+ 5.6285	+ 0.02673	+ 87.5168 0.796095	+ 1.0335 2.7906
JAN.17 (0H) (2447908.5)	X:	-49.6435	+ 5.05217	+360.2561 6.122564	+14.1700 4.6061
A FEV. 2 (0H)	Y:	+12.9648	- 0.53291	+ 76.3651 2.033548	+ 1.2969 1.1011
FEV. 1 (0H) (2447923.5)	X:	-18.3938	+ 1.43544	+441.0289 0.975879	+ 5.5075 5.5042
A FEV.17 (0H)	Y:	+10.6264	- 0.82227	+ 74.5505 3.317472	+ 1.3527 2.1939
FEV.17 (0H) (2447939.5)	X:	-32.9407	+ 0.90239	+472.5645 2.153202	+ 7.1826 4.0783
A MAR. 5 (0H)	Y:	- 0.2481	- 0.05684	+ 80.1223 4.420364	+ 1.9961 5.8617
MAR. 1 (0H) (2447951.5)	X:	+ 5.4831	- 5.06889	+381.7779 3.184298	+ 5.6752 1.7261
A MAR.17 (0H)	Y:	-12.8272	+ 1.28450	+ 56.1351 5.259490	+ 2.2864 5.4650
MAR.17 (0H) (2447967.5)	X:	-23.4006	- 0.02120	+468.8899 4.333941	+10.1392 1.3367
A AVR. 2 (0H)	Y:	- 6.0173	+ 0.91581	+ 67.9236 0.478566	+ 2.1015 4.2851
AVR. 1 (0H) (2447982.5)	X:	+11.7246	- 2.22153	+525.2819 5.499270	+12.7769 2.6928
A AVR.17 (0H)	Y:	- 2.3135	+ 0.38014	+ 80.8440 1.529410	+ 2.4097 4.9421
AVR.17 (0H) (2447998.5)	X:	+12.5648	- 2.97501	+516.3470 0.388429	+ 4.8332 6.1793
A MAI 3 (0H)	Y:	- 6.7554	+ 0.71615	+ 89.5598 2.661707	+ 1.1419 5.2050
MAI 1 (0H) (2448012.5)	X:	-30.9771	+ 0.11900	+516.3878 1.585508	+ 4.8017 1.2500
A MAI 17 (0H)	Y:	- 0.4121	+ 0.01796	+ 77.2774 3.804958	+ 0.9481 3.3330
MAI 17 (0H) (2448028.5)	X:	-40.6696	+ 1.94479	+553.3354 2.842719	+ 5.7234 5.0008
A JUN. 2 (0H)	Y:	+ 2.8376	+ 0.02914	+ 81.8400 5.083413	+ 0.7247 2.3737
JUN. 1 (0H) (2448043.5)	X:	-28.6913	+ 2.06216	+540.0538 3.997873	+ 4.2865 0.3833
A JUN.17 (0H)	Y:	+ 8.4559	- 0.72696	+ 96.4086 6.201366	+ 2.4389 2.8235
JUN.17 (0H) (2448059.5)	X:	- 7.3884	- 0.34402	+548.9031 5.334656	+ 8.0338 3.3763
A JUL. 3 (0H)	Y:	+ 0.8517	- 0.65776	+ 92.1465 1.149449	+ 0.9687 5.2084

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 8 DE SATURNE: JAPET N=0.079

		A0	A1	B0 F0	C0 P0
JUL. 1 (OH)	X:	-18.1599	- 1.60334	+565.5106	+ 9.1945
(2448073.5)				0.165943	5.4936
A JUL.17 (OH)	Y:	- 1.1617	- 0.35390	+ 88.0908	+ 3.2640
				2.362877	1.3612
JUL.17 (OH)	X:	-21.3615	- 1.11995	+535.6631	+15.3333
(2448089.5)				1.441796	1.5206
A AOU. 2 (OH)	Y:	+ 0.9246	+ 0.08835	+ 98.1100	+ 2.3380
				3.691058	3.0658
AOU. 1 (OH)	X:	- 8.8054	- 0.15501	+536.3564	+ 7.5244
(2448104.5)				2.706745	3.4130
A AOU.17 (OH)	Y:	+10.3993	- 0.70728	+111.4600	+ 0.9860
				4.973837	1.4036
AOU.17 (OH)	X:	+26.5309	- 4.46994	+535.6713	+ 8.5163
(2448120.5)				4.117388	1.1543
A SEP. 2 (OH)	Y:	+ 4.7792	- 0.45288	+109.1552	+ 1.5944
				6.165699	2.1378
SEP. 1 (OH)	X:	- 8.5837	- 2.24456	+551.1275	+ 6.5463
(2448135.5)				5.203254	2.0446
A SEP.17 (OH)	Y:	+ 1.7915	- 0.10962	+102.0067	+ 0.2334
				1.088650	5.6742
SEP.17 (OH)	X:	-10.2687	- 2.28663	+535.6637	+ 4.7607
(2448151.5)				0.107386	0.6155
A OCT. 3 (OH)	Y:	+ 4.4474	+ 0.00659	+ 98.7701	+ 1.8774
				2.405570	1.6521
OCT. 1 (OH)	X:	-34.8087	+ 2.96327	+503.2017	+ 4.9749
(2448165.5)				1.360424	0.8400
A OCT.17 (OH)	Y:	+ 7.2104	- 0.50810	+ 93.1666	+ 1.9740
				3.578300	3.2541
OCT.17 (OH)	X:	- 7.6850	+ 0.52376	+489.8005	+ 9.4219
(2448181.5)				2.544499	4.0483
A NOV. 2 (OH)	Y:	+ 4.2723	- 0.75881	+100.2977	+ 2.0363
				4.861199	0.3341
NOV. 1 (OH)	X:	-38.2009	+ 2.16028	+483.9839	+14.9807
(2448196.5)				3.616234	5.4769
A NOV.17 (OH)	Y:	- 1.1248	- 0.26082	+ 92.6577	+ 2.7979
				5.936742	1.5049
NOV.17 (OH)	X:	-56.4002	+ 2.99050	+414.0556	+ 1.4262
(2448212.5)				4.864851	6.0293
A DEC. 3 (OH)	Y:	+ 3.2396	+ 0.13364	+ 79.3487	+ 0.7037
				0.905914	2.5003
DEC. 1 (OH)	X:	-66.4973	+ 5.46220	+367.5698	+14.0747
(2448226.5)				6.119556	4.6904
A DEC.17 (OH)	Y:	+10.6303	- 0.15001	+ 71.8175	+ 0.9374
				2.019989	1.1041
DEC.17 (OH)	X:	-23.5415	+ 2.19646	+442.9840	+ 2.9717
(2448242.5)				1.052383	5.8036
A DEC.33 (OH)	Y:	+11.5385	- 0.80951	+ 63.9975	+ 1.1195
				3.367932	2.7575

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	9	4.488 0	86
Ariel	31	2.493 0	89
Umbriel	27	1.516 2	90
Titania	17	0.721 7	91
Obéron	27	0.466 7	93
	(days)	*(rad/d)*	

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 5 D'URANUS: MIRANDA N=4.4880

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
JAN. 1 (0H)	X:	+0.0094	+0.00044	+ 8.1391	+0.35482	+0.007461	+0.0059
(2447892.5)				3.274772	1.6923	6.2134	0.6863
A JAN.10 (0H)	Y:	-0.0122	+0.00016	+ 8.6835	+0.37975	+0.007996	+0.0058
				4.779904	3.2090	1.4531	2.0819
JAN.10 (0H)	X:	+0.0100	+0.00018	+ 8.1141	+0.35406	+0.007412	+0.0056
(2447901.5)				5.580540	4.0003	2.2272	5.3308
A JAN.19 (0H)	Y:	-0.0142	+0.00051	+ 8.6955	+0.38103	+0.008024	+0.0059
				0.801778	5.5172	3.7441	0.3962
JAN.19 (0H)	X:	+0.0140	-0.00066	+ 8.0973	+0.35282	+0.007406	+0.0066
(2447910.5)				1.603567	0.0271	4.5390	3.6312
A JAN.28 (0H)	Y:	-0.0130	+0.00009	+ 8.7169	+0.37937	+0.008102	+0.0051
				3.106890	1.5451	6.0818	4.9678
JAN.28 (0H)	X:	+0.0126	-0.00024	+ 8.0910	+0.35156	+0.007297	+0.0055
(2447919.5)				3.910410	2.3347	0.5736	1.9033
A FEV. 6 (0H)	Y:	-0.0107	-0.00038	+ 8.7506	+0.38083	+0.007977	+0.0060
				5.413376	3.8507	2.0986	3.4251
FEV. 6 (0H)	X:	+0.0094	+0.00043	+ 8.0904	+0.35100	+0.007461	+0.0063
(2447928.5)				6.217615	4.6503	2.8918	0.1590
A FEV.15 (0H)	Y:	-0.0100	-0.00043	+ 8.7904	+0.38332	+0.008028	+0.0053
				1.437509	6.1609	4.3923	1.7795
FEV.15 (0H)	X:	+0.0097	+0.00021	+ 8.1036	+0.35067	+0.007328	+0.0054
(2447937.5)				2.242692	0.6751	5.2064	4.7447
A FEV.24 (0H)	Y:	-0.0141	+0.00044	+ 8.8396	+0.38261	+0.008036	+0.0064
				3.744896	2.1879	0.4489	0.1467
FEV.24 (0H)	X:	+0.0115	-0.00022	+ 8.1246	+0.35229	+0.007304	+0.0054
(2447946.5)				4.551779	2.9856	1.2193	3.1236
A MAR. 5 (0H)	Y:	-0.0152	+0.00050	+ 8.8952	+0.38518	+0.008111	+0.0063
				6.053525	4.4989	2.7517	4.7026
MAR. 5 (0H)	X:	+0.0134	-0.00052	+ 8.1518	+0.35220	+0.007464	+0.0049
(2447955.5)				0.577646	5.3025	3.5493	1.3851
A MAR.14 (0H)	Y:	-0.0112	-0.00047	+ 8.9574	+0.38673	+0.008109	+0.0071
				2.079361	0.5260	5.0693	3.1040
MAR.14 (0H)	X:	+0.0111	+0.00006	+ 8.1931	+0.35352	+0.007337	+0.0054
(2447964.5)				2.887594	1.3274	5.8609	6.1523
A MAR.23 (0H)	Y:	-0.0107	-0.00045	+ 9.0255	+0.38904	+0.008133	+0.0064
				4.389239	2.8358	1.0969	1.2740
MAR.23 (0H)	X:	+0.0079	+0.00062	+ 8.2395	+0.35505	+0.007340	+0.0053
(2447973.5)				5.198026	3.6396	1.8965	4.4839
A AVR. 1 (0H)	Y:	-0.0130	+0.00009	+ 9.0920	+0.39265	+0.008412	+0.0069
				0.416596	5.1522	3.3999	5.8992
AVR. 1 (0H)	X:	+0.0108	-0.00012	+ 8.2919	+0.35629	+0.007457	+0.0059
(2447982.5)				1.225393	5.9546	4.2201	2.8813
A AVR.10 (0H)	Y:	-0.0154	+0.00044	+ 9.1671	+0.39439	+0.008269	+0.0064
				2.727278	1.1759	5.7178	4.1848
AVR.10 (0H)	X:	+0.0131	-0.00054	+ 8.3505	+0.35969	+0.007594	+0.0063
(2447991.5)				3.536743	1.9852	0.2373	1.1224
A AVR.19 (0H)	Y:	-0.0150	+0.00015	+ 9.2419	+0.39774	+0.008284	+0.0058
				5.038797	3.4851	1.7383	2.5519
AVR.19 (0H)	X:	+0.0116	-0.00007	+ 8.4136	+0.36099	+0.007611	+0.0064
(2448000.5)				5.847820	4.2976	2.5691	5.8068
A AVR.28 (0H)	Y:	-0.0107	-0.00072	+ 9.3106	+0.40066	+0.008456	+0.0059
				1.067185	5.7992	4.0492	0.8351
AVR.28 (0H)	X:	+0.0094	+0.00033	+ 8.4815	+0.36452	+0.007663	+0.0063
(2448009.5)				1.876323	0.3251	4.8679	3.9899
A MAI 7 (0H)	Y:	-0.0121	-0.00028	+ 9.3817	+0.40307	+0.008414	+0.0059
				3.378973	1.8237	0.0771	5.5776

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 5 D'URANUS: MIRANDA N=4.4880

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
MAI 7 (OH)	X:	+0.0084	+0.00038	+ 8.5474	+0.36891	+0.007809	+0.0061
(2448018.5)				4.188248	2.6380	0.8798	2.3142
A MAI 16 (OH)	Y:	-0.0166	+0.00059	+ 9.4446	+0.40453	+0.008527	+0.0064
				5.690842	4.1354	2.4062	3.9590
MAI 16 (OH)	X:	+0.0119	-0.00039	+ 8.6147	+0.37039	+0.007751	+0.0060
(2448027.5)				0.216278	4.9463	3.2065	0.6561
A MAI 25 (OH)	Y:	-0.0158	+0.00020	+ 9.5010	+0.40772	+0.008595	+0.0063
				1.719655	0.1625	4.7024	2.3024
MAI 25 (OH)	X:	+0.0135	-0.00058	+ 8.6788	+0.37312	+0.007886	+0.0052
(2448036.5)				2.527642	0.9737	5.5181	5.2454
A JUN. 3 (OH)	Y:	-0.0135	-0.00036	+ 9.5497	+0.41124	+0.008736	+0.0075
				4.031763	2.4725	0.7111	0.6165
JUN. 3 (OH)	X:	+0.0091	+0.00039	+ 8.7362	+0.37623	+0.007901	+0.0056
(2448045.5)				4.838826	3.2819	1.5388	3.6145
A JUN.12 (OH)	Y:	-0.0120	-0.00051	+ 9.5873	+0.41158	+0.008780	+0.0069
				0.060000	4.7822	3.0402	5.2169
JUN.12 (OH)	X:	+0.0080	+0.00045	+ 8.7869	+0.37895	+0.007976	+0.0055
(2448054.5)				0.866408	5.5899	3.8403	1.9909
A JUN.21 (OH)	Y:	-0.0146	+0.00005	+ 9.6173	+0.41440	+0.008764	+0.0073
				2.371509	0.8052	5.3269	3.4862
JUN.21 (OH)	X:	+0.0104	-0.00015	+ 8.8263	+0.38031	+0.008235	+0.0060
(2448063.5)				3.176583	1.6187	6.1630	0.4470
A JUN.30 (OH)	Y:	-0.0184	+0.00069	+ 9.6341	+0.41602	+0.008765	+0.0068
				4.682603	3.1117	1.3453	1.7094
JUN.30 (OH)	X:	+0.0121	-0.00044	+ 8.8588	+0.38314	+0.008108	+0.0058
(2448072.5)				5.486461	3.9209	2.1670	4.9417
A JUL. 9 (OH)	Y:	-0.0152	-0.00014	+ 9.6374	+0.41577	+0.008739	+0.0066
				0.709663	5.4182	3.6607	0.1230
JUL. 9 (OH)	X:	+0.0115	-0.00022	+ 8.8784	+0.38532	+0.008190	+0.0070
(2448081.5)				1.512548	6.2266	4.4590	3.3490
A JUL.18 (OH)	Y:	-0.0119	-0.00074	+ 9.6276	+0.41607	+0.008922	+0.0059
				3.019396	1.4447	5.9645	4.5926
JUL.18 (OH)	X:	+0.0072	+0.00058	+ 8.8836	+0.38535	+0.008284	+0.0064
(2448090.5)				3.820841	2.2499	0.4928	1.5639
A JUL.27 (OH)	Y:	-0.0147	-0.00001	+ 9.6083	+0.41534	+0.008753	+0.0060
				5.328518	3.7473	1.9908	3.0650
JUL.27 (OH)	X:	+0.0077	+0.00032	+ 8.8784	+0.38674	+0.008229	+0.0066
(2448099.5)				6.128671	4.5516	2.7783	6.2011
A AOU. 5 (OH)	Y:	-0.0171	+0.00041	+ 9.5755	+0.41599	+0.008776	+0.0060
				1.354023	6.0530	4.2778	1.3609
AOU. 5 (OH)	X:	+0.0119	-0.00061	+ 8.8598	+0.38535	+0.008200	+0.0063
(2448108.5)				2.152287	0.5712	5.0952	4.3424
A AOU.14 (OH)	Y:	-0.0172	+0.00029	+ 9.5302	+0.41451	+0.008984	+0.0060
				3.661607	2.0797	0.3068	6.1673
AOU.14 (OH)	X:	+0.0108	-0.00026	+ 8.8281	+0.38525	+0.008193	+0.0058
(2448117.5)				4.458685	2.8738	1.1036	2.7929
A AOU.23 (OH)	Y:	-0.0141	-0.00039	+ 9.4817	+0.41315	+0.008695	+0.0065
				5.968553	4.3786	2.6052	4.2996
AOU.23 (OH)	X:	+0.0079	+0.00035	+ 8.7829	+0.38489	+0.008339	+0.0055
(2448126.5)				0.481100	5.1799	3.3930	0.9638
A SEP. 1 (OH)	Y:	-0.0122	-0.00064	+ 9.4226	+0.41161	+0.008712	+0.0070
				1.991510	0.4005	4.9055	2.7941
SEP. 1 (OH)	X:	+0.0068	+0.00039	+ 8.7320	+0.38149	+0.008151	+0.0052
(2448135.5)				2.785707	1.1958	5.7132	5.7198
A SEP.10 (OH)	Y:	-0.0166	+0.00041	+ 9.3569	+0.40905	+0.008732	+0.0070
				4.296749	2.7057	0.9314	0.9557

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 5 D'URANUS: MIRANDA N=4.4880

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
SEP.10 (OH) (2448144.5)	X:	+0.0083	-0.00003	+ 8.6720 5.090379	+0.38096 3.4962	+0.008073 1.7089	+0.0056 4.0263
A SEP.19 (OH)	Y:	-0.0181	+0.00055	+ 9.2881 0.318368	+0.40777 5.0083	+0.008661 3.2219	+0.0065 5.5880
SEP.19 (OH) (2448153.5)	X:	+0.0112	-0.00059	+ 8.6021 1.110848	+0.37847 5.8011	+0.008131 4.0100	+0.0052 2.5029
A SEP.28 (OH)	Y:	-0.0146	-0.00029	+ 9.2158 2.622001	+0.40349 1.0303	+0.008649 5.5476	+0.0069 3.7556
SEP.28 (OH) (2448162.5)	X:	+0.0087	+0.00003	+ 8.5311 3.414001	+0.37482 1.8164	+0.007934 0.0363	+0.0061 0.6860
A OCT. 7 (OH)	Y:	-0.0134	-0.00043	+ 9.1458 4.925637	+0.40212 3.3314	+0.008533 1.5486	+0.0059 2.1326
OCT. 7 (OH) (2448171.5)	X:	+0.0050	+0.00070	+ 8.4537 5.716808	+0.37160 4.1205	+0.007949 2.3422	+0.0060 5.4034
A OCT.16 (OH)	Y:	-0.0143	-0.00008	+ 9.0728 0.945572	+0.40066 5.6371	+0.008578 3.8388	+0.0059 0.3660
OCT.16 (OH) (2448180.5)	X:	+0.0072	+0.00002	+ 8.3756 1.736105	+0.36837 0.1388	+0.007854 4.6401	+0.0064 3.6157
A OCT.25 (OH)	Y:	-0.0174	+0.00052	+ 9.0057 3.247732	+0.39595 1.6564	+0.008438 6.1662	+0.0054 5.0172
OCT.25 (OH) (2448189.5)	X:	+0.0093	-0.00040	+ 8.2966 4.038829	+0.36630 2.4409	+0.007809 0.6438	+0.0058 1.8766
A NOV. 3 (OH)	Y:	-0.0172	+0.00034	+ 8.9444 5.550302	+0.39429 3.9577	+0.008316 2.1756	+0.0058 3.4386
NOV. 3 (OH) (2448198.5)	X:	+0.0088	-0.00017	+ 8.2169 0.057639	+0.36163 4.7466	+0.007807 2.9660	+0.0062 0.1472
A NOV.12 (OH)	Y:	-0.0127	-0.00059	+ 8.8848 1.569198	+0.39163 6.2628	+0.008274 4.4836	+0.0053 1.7879
NOV.12 (OH) (2448207.5)	X:	+0.0065	+0.00029	+ 8.1444 2.360049	+0.35896 0.7623	+0.007593 5.2526	+0.0053 4.7321
A NOV.21 (OH)	Y:	-0.0134	-0.00025	+ 8.8343 3.871283	+0.38887 2.2835	+0.008229 0.5100	+0.0063 0.1332
NOV.21 (OH) (2448216.5)	X:	+0.0044	+0.00053	+ 8.0722 4.662695	+0.35628 3.0658	+0.007511 1.2676	+0.0051 3.0341
A NOV.30 (OH)	Y:	-0.0169	+0.00052	+ 8.7889 6.173464	+0.38647 4.5912	+0.008304 2.8247	+0.0062 4.7367
NOV.30 (OH) (2448225.5)	X:	+0.0078	-0.00027	+ 8.0044 0.681827	+0.35187 5.3708	+0.007439 3.5885	+0.0051 1.3510
A DEC. 9 (OH)	Y:	-0.0170	+0.00035	+ 8.7542 2.192663	+0.38469 0.6112	+0.008157 5.1268	+0.0064 3.0441
DEC. 9 (OH) (2448234.5)	X:	+0.0095	-0.00052	+ 7.9438 2.984823	+0.34902 1.3923	+0.007389 5.8935	+0.0049 6.1212
A DEC.18 (OH)	Y:	-0.0151	-0.00008	+ 8.7287 4.495866	+0.38464 2.9160	+0.008144 1.1328	+0.0064 1.2275
DEC.18 (OH) (2448243.5)	X:	+0.0061	+0.00026	+ 7.8883 5.288040	+0.34561 3.6971	+0.007256 1.9283	+0.0050 4.4074
A DEC.27 (OH)	Y:	-0.0127	-0.00048	+ 8.7096 0.515728	+0.38250 5.2246	+0.008172 3.4560	+0.0062 5.8525
DEC.27 (OH) (2448252.5)	X:	+0.0046	+0.00040	+ 7.8406 1.308725	+0.34381 6.0041	+0.007249 4.2228	+0.0053 2.8141
A JAN. 5 (OH)	Y:	-0.0147	+0.00004	+ 8.7042 2.819453	+0.38184 1.2450	+0.008028 5.7562	+0.0060 4.1148

1990 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) (2447892.5)	X:	+0.0325	-0.00003	+12.2682 0.416031	+0.00571 4.4365	+0.000084 0.7552	+0.0107 2.5273
A FEV. 1 (OH)	Y:	+0.0080	-0.00005	+12.8284 1.944956	+0.00596 0.5421	+0.000096 2.3350	+0.0114 4.0548
FEV. 1 (OH) (2447923.5)	X:	+0.0308	+0.00007	+12.2316 2.291820	+0.00283 1.2818	+0.000086 2.6606	+0.0114 6.2702
A MAR. 4 (OH)	Y:	+0.0087	-0.00003	+12.9450 3.818372	+0.00731 3.3121	+0.000081 4.3916	+0.0111 1.5745
MAR. 4 (OH) (2447954.5)	X:	+0.0310	+0.00007	+12.3549 4.173150	+0.00658 4.0969	+0.000076 4.7461	+0.0101 3.7787
A AVR. 4 (OH)	Y:	+0.0078	+0.00003	+13.2067 5.698107	+0.01076 5.6238	+0.000048 0.5754	+0.0132 5.3241
AVR. 4 (OH) (2447985.5)	X:	+0.0320	+0.00006	+12.6188 6.059758	+0.01052 6.2399	+0.000031 0.5965	+0.0126 1.3529
A MAI 5 (OH)	Y:	+0.0081	+0.00001	+13.5566 1.300831	+0.01254 1.4854	+0.000038 3.9042	+0.0113 2.7031
MAI 5 (OH) (2448016.5)	X:	+0.0325	+0.00008	+12.9584 1.667607	+0.01201 1.9432	+0.000048 4.6406	+0.0118 4.9966
A JUN. 5 (OH)	Y:	+0.0071	+0.00006	+13.9068 3.192180	+0.01095 3.5295	+0.000082 6.1873	+0.0129 0.3691
JUN. 5 (OH) (2448047.5)	X:	+0.0345	-0.00001	+13.2700 3.560455	+0.00939 3.9520	+0.000107 0.6351	+0.0122 2.5639
A JUL. 6 (OH)	Y:	+0.0059	+0.00007	+14.1488 5.085600	+0.00652 5.7734	+0.000110 2.1064	+0.0128 4.0510
JUL. 6 (OH) (2448078.5)	X:	+0.0359	-0.00004	+13.4390 5.451704	+0.00307 0.0076	+0.000123 2.6914	+0.0119 0.0404
A AOU. 6 (OH)	Y:	+0.0069	-0.00002	+14.2004 0.694904	+0.00353 2.8176	+0.000115 4.2682	+0.0137 1.5913
AOU. 6 (OH) (2448109.5)	X:	+0.0347	+0.00000	+13.3936 1.055362	+0.00554 4.3147	+0.000088 4.6481	+0.0126 3.8842
A SEP. 6 (OH)	Y:	+0.0064	+0.00000	+14.0438 2.583116	+0.00823 5.7198	+0.000078 0.1148	+0.0119 5.2878
SEP. 6 (OH) (2448140.5)	X:	+0.0348	-0.00007	+13.1474 2.935793	+0.01115 0.0857	+0.000049 0.4791	+0.0120 1.2356
A OCT. 7 (OH)	Y:	+0.0056	+0.00001	+13.7317 4.464576	+0.01209 1.5869	+0.000043 2.7642	+0.0116 2.8671
OCT. 7 (OH) (2448171.5)	X:	+0.0334	-0.00004	+12.7821 4.810535	+0.01372 2.0518	+0.000015 3.7638	+0.0107 5.0085
A NOV. 7 (OH)	Y:	+0.0063	-0.00004	+13.3687 0.055907	+0.01342 3.6515	+0.000057 6.0234	+0.0124 0.2918
NOV. 7 (OH) (2448202.5)	X:	+0.0312	+0.00000	+12.3973 0.398381	+0.01331 4.0114	+0.000045 0.5540	+0.0109 2.5621
A DEC. 8 (OH)	Y:	+0.0055	+0.00002	+13.0488 1.925498	+0.01150 5.7539	+0.000078 2.0793	+0.0114 3.9635
DEC. 8 (OH) (2448233.5)	X:	+0.0315	-0.00007	+12.0750 2.268171	+0.01061 5.9674	+0.000077 2.5141	+0.0102 6.2233
A JAN. 8 (OH)	Y:	+0.0046	+0.00004	+12.8490 3.793506	+0.00780 1.7122	+0.000087 4.0835	+0.0108 1.4767

1990 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)	X:	+0.0758	-0.00016	+17.0825	+0.00840	+0.000114	+0.0345
(2447892.5)				0.302238	4.3861	0.7363	2.9661
A JAN.28 (OH)	Y:	+0.0703	+0.00087	+17.8732	+0.00786	+0.000126	+0.0360
				1.831084	0.4354	1.9799	4.5041
JAN.28 (OH)	X:	+0.0653	-0.00070	+17.0247	+0.00562	+0.000109	+0.0339
(2447919.5)				3.531922	2.2618	4.1151	3.2710
A FEV.24 (OH)	Y:	+0.0972	-0.00054	+18.0022	+0.00980	+0.000121	+0.0349
				5.058695	4.3908	5.4190	4.8194
FEV.24 (OH)	X:	+0.0468	+0.00077	+17.1418	+0.00747	+0.000106	+0.0303
(2447946.5)				0.480755	0.1986	0.6622	3.3433
A MAR.23 (OH)	Y:	+0.0770	-0.00039	+18.2906	+0.01384	+0.000065	+0.0307
				2.006350	1.7722	2.6379	4.8866
MAR.23 (OH)	X:	+0.0732	+0.00016	+17.4107	+0.01256	+0.000067	+0.0351
(2447973.5)				3.716617	3.7508	4.0554	3.5151
A AVR.19 (OH)	Y:	+0.0694	+0.00099	+18.6923	+0.01663	+0.000056	+0.0376
				5.241512	5.2148	0.7099	5.0138
AVR.19 (OH)	X:	+0.0752	-0.00088	+17.7926	+0.01605	+0.000016	+0.0364
(2448000.5)				0.673305	0.8426	2.9566	3.8447
A MAI 16 (OH)	Y:	+0.1006	-0.00016	+19.1346	+0.01629	+0.000097	+0.0388
				2.196327	2.2852	4.5339	5.3521
MAI 16 (OH)	X:	+0.0504	+0.00062	+18.2102	+0.01534	+0.000080	+0.0319
(2448027.5)				3.916154	4.1337	0.6125	3.9839
A JUN.12 (OH)	Y:	+0.0877	-0.00067	+19.5183	+0.01330	+0.000145	+0.0333
				5.440991	5.7579	2.2230	5.5001
JUN.12 (OH)	X:	+0.0722	+0.00060	+18.5534	+0.01048	+0.000153	+0.0362
(2448054.5)				0.876861	1.1225	3.7688	4.0993
A JUL. 9 (OH)	Y:	+0.0676	+0.00090	+19.7534	+0.00728	+0.000169	+0.0376
				2.402195	3.1450	5.6182	5.5784
JUL. 9 (OH)	X:	+0.0845	-0.00087	+18.7221	+0.00391	+0.000169	+0.0385
(2448081.5)				4.119803	5.1923	1.3121	4.4185
A AOU. 5 (OH)	Y:	+0.0972	+0.00007	+19.7757	+0.00628	+0.000165	+0.0399
				5.646538	1.5471	3.0368	5.9140
AOU. 5 (OH)	X:	+0.0557	+0.00025	+18.6583	+0.00704	+0.000143	+0.0319
(2448108.5)				1.077641	4.1125	4.6890	4.6039
A SEP. 1 (OH)	Y:	+0.0944	-0.00105	+19.5770	+0.01143	+0.000121	+0.0339
				2.605633	5.5823	0.2271	6.1286
SEP. 1 (OH)	X:	+0.0665	+0.00074	+18.3767	+0.01350	+0.000103	+0.0336
(2448135.5)				4.314493	1.3181	1.7489	4.6447
A SEP.28 (OH)	Y:	+0.0649	+0.00044	+19.2154	+0.01691	+0.000042	+0.0351
				5.843508	2.8532	4.5615	6.1614
SEP.28 (OH)	X:	+0.0857	-0.00086	+17.9550	+0.01778	+0.000043	+0.0366
(2448162.5)				1.264446	4.6568	5.7179	4.9306
A OCT.25 (OH)	Y:	+0.0858	+0.00030	+18.7716	+0.01798	+0.000061	+0.0383
				2.793440	6.2512	2.3077	0.1568
OCT.25 (OH)	X:	+0.0591	-0.00027	+17.4831	+0.01926	+0.000057	+0.0301
(2448189.5)				4.494564	1.7527	4.8009	5.1775
A NOV.21 (OH)	Y:	+0.0927	-0.00097	+18.3487	+0.01625	+0.000071	+0.0336
				6.022434	3.4319	6.0676	0.3857
NOV.21 (OH)	X:	+0.0572	+0.00072	+17.0450	+0.01706	+0.000092	+0.0301
(2448216.5)				1.438200	5.0376	1.5472	5.1620
A DEC.18 (OH)	Y:	+0.0620	+0.00027	+18.0276	+0.01255	+0.000097	+0.0328
				2.964789	0.6015	2.9595	0.4065
DEC.18 (OH)	X:	+0.0795	-0.00056	+16.7010	+0.01285	+0.000120	+0.0342
(2448243.5)				4.664578	2.0739	4.7476	5.3941
A JAN.14 (OH)	Y:	+0.0737	+0.00080	+17.8584	+0.00849	+0.000102	+0.0368
				6.189811	4.3201	0.0412	0.6473

1990 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)	X:	-0.1082	+0.00076	+28.0212	+0.00858	+0.000466	+0.0361
(2447892.5)				6.030378	3.1636	4.8382	3.6947
A JAN.18 (OH)	Y:	+0.0671	-0.00210	+29.2996	+0.00377	+0.000766	+0.0380
				1.274912	1.1502	6.2622	5.2473
JAN.18 (OH)	X:	-0.1110	+0.00044	+27.9357	+0.01007	+0.000297	+0.0355
(2447909.5)				5.726380	3.8396	0.1608	3.3874
A FEV. 4 (OH)	Y:	+0.0134	+0.00045	+29.4092	+0.01452	+0.000258	+0.0377
				0.971762	0.0701	1.6696	4.9331
FEV. 4 (OH)	X:	-0.0681	-0.00011	+27.9421	+0.00592	+0.000175	+0.0218
(2447926.5)				5.425423	5.0283	4.8884	2.9036
A FEV.21 (OH)	Y:	+0.0207	-0.00183	+29.6179	+0.02055	+0.000295	+0.0233
				0.666739	0.0781	2.1207	4.3823
FEV.21 (OH)	X:	-0.0861	+0.00242	+28.0802	+0.01116	+0.000284	+0.0246
(2447943.5)				5.126109	4.8440	4.3590	2.0309
A MAR.10 (OH)	Y:	-0.0180	+0.00472	+29.9630	+0.01234	+0.000693	+0.0242
				0.367124	0.0932	0.0772	3.5505
MAR.10 (OH)	X:	-0.0391	-0.00069	+28.3155	+0.01645	+0.000267	+0.0164
(2447960.5)				4.826020	4.6295	5.6829	1.1965
A MAR.27 (OH)	Y:	+0.0292	+0.00005	+30.3226	+0.02502	+0.000287	+0.0176
				0.067028	6.1401	1.3904	2.7577
MAR.27 (OH)	X:	-0.0581	+0.00055	+28.6389	+0.02192	+0.000098	+0.0277
(2447977.5)				4.527123	4.6596	4.3263	0.2470
A AVR.13 (OH)	Y:	+0.0688	+0.00018	+30.7589	+0.02727	+0.000109	+0.0300
				6.050646	6.2133	4.7256	1.7886
AVR.13 (OH)	X:	-0.0445	-0.00383	+29.0450	+0.02328	+0.000212	+0.0316
(2447994.5)				4.232014	4.1404	5.0961	6.2438
A AVR.30 (OH)	Y:	+0.0366	+0.00339	+31.2552	+0.01982	+0.000707	+0.0352
				5.756133	5.3316	0.4350	1.4322
AVR.30 (OH)	X:	-0.0913	+0.0[illegible]86	+29.4613	+0.02842	+0.000289	+0.0379
(2448011.5)				3.935730	4.0696	0.0333	5.5233
A MAI 17 (OH)	Y:	+0.0933	-0.00153	+31.6511	+0.02649	+0.000149	+0.0397
				5.458750	5.8474	3.1135	0.7529
MAI 17 (OH)	X:	-0.1122	-0.00063	+29.8941	+0.02590	+0.000139	+0.0424
(2448028.5)				3.640769	4.0575	1.5718	5.2624
A JUN. 3 (OH)	Y:	+0.0504	+0.00062	+32.0273	+0.02275	+0.000233	+0.0461
				5.164713	5.6797	2.4396	0.5089
JUN. 3 (OH)	X:	-0.1001	-0.00063	+30.2804	+0.01757	+0.000523	+0.0340
(2448045.5)				3.349220	3.2192	5.0632	4.8193
A JUN.20 (OH)	Y:	+0.0501	-0.00232	+32.3100	+0.01490	+0.000898	+0.0371
				4.874301	4.3744	0.5611	0.0774
JUN.20 (OH)	X:	-0.1388	+0.00340	+30.5195	+0.02648	+0.000825	+0.0356
(2448062.5)				3.054232	3.7657	0.7004	4.2884
A JUL. 7 (OH)	Y:	+0.0173	+0.00070	+32.4403	+0.01584	+0.000438	+0.0394
				4.579437	5.8161	2.1273	5.8129
JUL. 7 (OH)	X:	-0.0682	-0.00074	+30.7052	+0.00775	+0.000173	+0.0236
(2448079.5)				2.761441	3.9899	5.9403	3.8835
A JUL.24 (OH)	Y:	+0.0080	-0.00052	+32.4367	+0.01226	+0.000300	+0.0248
				4.286948	6.2121	1.6670	5.3944
JUL.24 (OH)	X:	-0.0773	+0.00297	+30.6880	+0.00330	+0.000616	+0.0213
(2448096.5)				2.468515	0.4167	4.9357	2.6984
A AOU.10 (OH)	Y:	+0.0156	+0.00249	+32.2850	+0.01179	+0.000806	+0.0223
				3.995247	1.3267	6.1244	4.2586
AOU.10 (OH)	X:	-0.0469	-0.00050	+30.5263	+0.01753	+0.000863	+0.0216
(2448113.5)				2.171969	4.3670	0.1550	2.0898
A AOU.27 (OH)	Y:	+0.0192	+0.00276	+31.9932	+0.02272	+0.000783	+0.0229
				3.699432	6.1145	1.8091	3.6618

1990 COORDONNEES EQUATORIALES DIFFERENTIELLES

DU SATELLITE 3 D'URANUS: TITANIA N=0.7217

		A0	A1	B0 F0	B1 F1	B2 F2	C0 P0
ADU.27 (OH) (2448130.5)	X:	-0.0516	-0.00001	+30.2503 1.876668	+0.02058 4.9959	+0.000168 4.9337	+0.0293 1.1809
A SEP.13 (OH)	Y:	+0.0853	-0.00082	+31.6333 3.404436	+0.02615 0.2069	+0.000008 5.2008	+0.0315 2.7169
SEP.13 (OH) (2448147.5)	X:	-0.0841	-0.00101	+29.8637 1.578699	+0.02783 4.7903	+0.000089 3.0600	+0.0403 0.9008
A SEP.30 (OH)	Y:	+0.0595	+0.00231	+31.1681 3.107425	+0.02187 0.1726	+0.000367 5.9331	+0.0410 2.3944
SEP.30 (OH) (2448164.5)	X:	-0.0885	-0.00035	+29.3959 1.279769	+0.03075 4.2103	+0.000796 6.1826	+0.0360 0.3289
A OCT.17 (OH)	Y:	+0.0991	-0.00401	+30.7412 2.808639	+0.03061 6.0457	+0.000395 1.9074	+0.0362 1.8851
OCT.17 (OH) (2448181.5)	X:	-0.1187	+0.00081	+28.9096 0.980129	+0.03061 4.3360	+0.000111 1.7675	+0.0405 6.2256
A NOV. 3 (OH)	Y:	+0.0511	-0.00010	+30.2880 2.507793	+0.02786 6.0049	+0.000226 3.2870	+0.0428 1.4626
NOV. 3 (OH) (2448196.5)	X:	-0.0883	-0.00083	+28.4189 0.678264	+0.02688 4.0409	+0.000045 5.3974	+0.0314 5.9161
A NOV.20 (OH)	Y:	+0.0159	-0.00029	+29.8927 2.204447	+0.02232 5.5547	+0.000300 1.4320	+0.0334 1.1509
NOV.20 (OH) (2448215.5)	X:	-0.1225	+0.00527	+28.0104 0.376999	+0.03418 3.7896	+0.000628 0.2216	+0.0267 5.1375
A DEC. 7 (OH)	Y:	+0.0306	-0.00092	+29.5908 1.903359	+0.02394 5.7643	+0.000321 2.2118	+0.0278 0.3199
DEC. 7 (OH) (2448232.5)	X:	-0.0581	-0.00082	+27.5890 0.073656	+0.02051 3.6848	+0.000070 1.4660	+0.0211 4.7120
A DEC.24 (OH)	Y:	+0.0039	+0.00056	+29.3716 1.598211	+0.01577 5.5446	+0.000309 1.9324	+0.0222 6.2428
DEC.24 (OH) (2448249.5)	X:	-0.0457	+0.00065	+27.2936 6.052906	+0.01700 3.2665	+0.000256 5.6060	+0.0174 3.4560
A JAN.10 (OH)	Y:	+0.0398	-0.00018	+29.2639 1.293420	+0.00735 5.6667	+0.000275 0.6077	+0.0186 4.9586

1990 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:	-0.0182	+0.00103	+37.4745	+0.00863	+0.000175	+0.0026
(2447892.5)				2.567839	0.3783	1.1581	3.0913
A JAN.28 (OH)	Y:	-0.0274	+0.00267	+39.1899	+0.01132	+0.000302	+0.0041
				4.115688	2.8100	3.7474	4.2640
JAN.28 (OH)	X:	-0.0146	-0.00195	+37.3759	+0.00460	+0.000318	+0.0173
(2447919.5)				2.613754	1.7475	1.9769	2.8950
A FEV.24 (OH)	Y:	+0.0404	+0.00022	+39.4909	+0.01584	+0.000375	+0.0198
				4.139528	3.7713	3.6195	4.4295
FEV.24 (OH)	X:	-0.0600	-0.00219	+37.6518	+0.01223	+0.000398	+0.0287
(2447946.5)				2.642119	2.4374	2.4529	3.5198
A MAR.23 (OH)	Y:	+0.0431	-0.00189	+40.1162	+0.02843	+0.000234	+0.0287
				4.166922	4.0579	3.4858	5.0297
MAR.23 (OH)	X:	-0.0844	-0.00045	+38.2560	+0.02391	+0.000275	+0.0296
(2447973.5)				2.673951	2.5854	2.8680	4.1572
A AVR.19 (OH)	Y:	-0.0230	-0.00131	+40.9762	+0.03815	+0.000061	+0.0321
				4.198137	4.1167	0.4546	5.7405
AVR.19 (OH)	X:	-0.0554	+0.00104	+39.0682	+0.03544	+0.000096	+0.0224
(2448000.5)				2.708910	2.7201	4.7782	4.8918
A MAI 16 (OH)	Y:	-0.0663	+0.00027	+41.9527	+0.03733	+0.000237	+0.0242
				4.232436	4.2644	0.6941	0.1406
MAI 16 (OH)	X:	+0.0035	-0.00024	+39.9956	+0.03257	+0.000228	+0.0077
(2448027.5)				2.746456	2.8400	5.1845	5.6524
A JUN.12 (OH)	Y:	-0.0347	+0.00107	+42.8049	+0.02784	+0.000297	+0.0081
				4.270226	4.5042	0.9603	1.0657
JUN.12 (OH)	X:	+0.0149	-0.00236	+40.7679	+0.01842	+0.000317	+0.0111
(2448054.5)				2.786468	2.9138	5.0907	2.8261
A JUL. 9 (OH)	Y:	+0.0346	+0.00019	+43.3306	+0.01293	+0.000273	+0.0112
				4.310685	5.0937	0.9157	4.3115
JUL. 9 (OH)	X:	-0.0407	-0.00244	+41.1331	+0.00183	+0.000307	+0.0256
(2448081.5)				2.826849	4.3624	5.2014	3.5536
A AOU. 5 (OH)	Y:	+0.0630	-0.00152	+43.3818	+0.01217	+0.000286	+0.0260
				4.352613	0.7390	0.4848	5.0540
AOU. 5 (OH)	X:	-0.1158	+0.00109	+40.9469	+0.01369	+0.000334	+0.0284
(2448108.5)				2.865651	5.7941	5.8947	4.1721
A SEP. 1 (OH)	Y:	+0.0146	-0.00171	+42.9383	+0.02492	+0.000349	+0.0326
				4.393552	1.3036	0.3893	5.7527
SEP. 1 (OH)	X:	-0.1243	+0.00433	+40.3049	+0.02373	+0.000406	+0.0241
(2448135.5)				2.901654	5.9613	0.0360	4.8743
A SEP.28 (OH)	Y:	-0.0525	+0.00015	+42.1146	+0.03153	+0.000195	+0.0249
				4.430529	1.3804	0.9673	0.0269
SEP.28 (OH)	X:	-0.0600	+0.00343	+39.3827	+0.03117	+0.000320	+0.0105
(2448162.5)				2.934579	6.1509	0.2800	5.4055
A OCT.25 (OH)	Y:	-0.0576	+0.00195	+41.1468	+0.03494	+0.000291	+0.0104
				4.462271	1.3021	3.0346	0.5141
OCT.25 (OH)	X:	-0.0050	-0.00032	+38.3756	+0.03617	+0.000242	+0.0072
(2448189.5)				2.964012	6.2047	1.4047	3.5454
A NOV.21 (OH)	Y:	+0.0013	+0.00157	+40.2397	+0.03326	+0.000484	+0.0085
				4.490387	1.3846	3.5547	4.6828
NOV.21 (OH)	X:	-0.0194	-0.00267	+37.4334	+0.03685	+0.000414	+0.0217
(2448216.5)				2.991008	0.0023	2.3778	3.7600
A DEC.18 (OH)	Y:	+0.0473	-0.00038	+39.5488	+0.02373	+0.000431	+0.0221
				4.516534	1.6921	3.7943	5.3419
DEC.18 (OH)	X:	-0.0727	-0.00149	+36.6834	+0.02781	+0.000400	+0.0285
(2448243.5)				3.016748	0.1910	2.6424	4.4144
A JAN.14 (OH)	Y:	+0.0197	-0.00131	+39.1660	+0.01679	+0.000280	+0.0308
				4.541845	2.5641	4.3423	5.9625

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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 **1990** 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.

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*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 **1990** with an accuracy of 0.01 arcsecond (″).*

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

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

*This booklet also contains a method of calculation to predict the phenomena of the satellites of Jupiter in **1990**.*

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

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