



Satellites galiléens de Jupiter : phénomènes et configurations pour 1989, suivis d'une méthode permettant de calculer les phénomènes pour 1990

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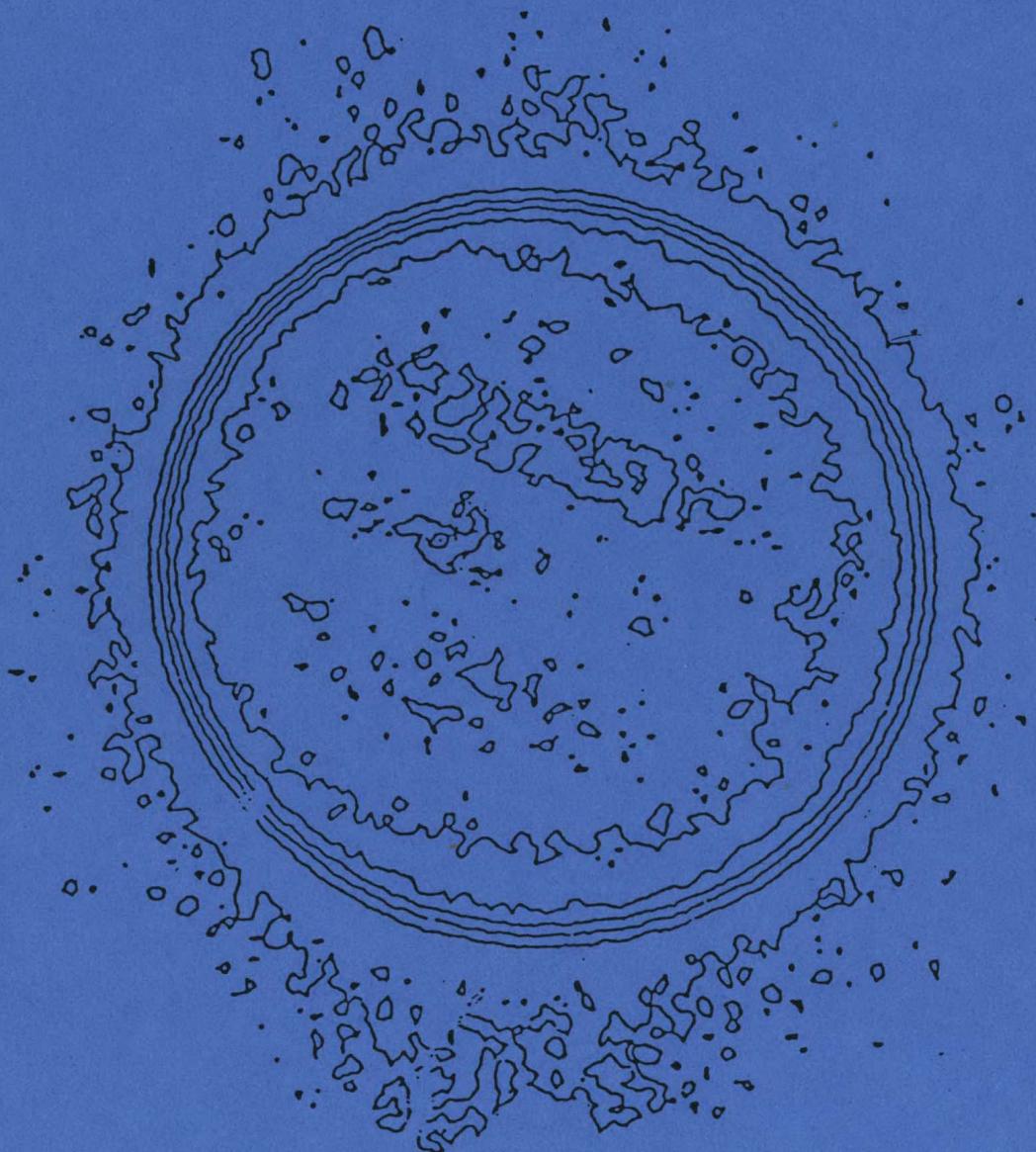
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SATELLITES GALILÉENS DE JUPITER

PHÉNOMÈNES ET CONFIGURATIONS POUR 1989

SUIVIS D'UNE MÉTHODE PERMETTANT DE CALCULER LES
PHÉNOMÈNES POUR 1990



Supplément à la CONNAISSANCE DES TEMPS

à l'usage des observateurs

Bureau des Longitudes, UA CNRS

Paris, juin 1988

SATELLITES GALILÉENS DE JUPITER

GALILEAN SATELLITES OF JUPITER

PHÉNOMÈNES ET CONFIGURATIONS POUR 1989, SUIVIS D'UNE
MÉTHODE PERMETTANT DE CALCULER LES PHÉNOMÈNES POUR 1990

PHENOMENA AND CONFIGURATIONS FOR 1989, FOLLOWED BY A
METHOD FOR THE CALCULATION OF THE PHENOMENA FOR 1990

Supplément à la CONNAISSANCE DES TEMPS
à l'usage des observateurs

Bureau des Longitudes, UA CNRS

Paris, juin 1988

Note : Les calculs nécessaires à l'élaboration de ce fascicule ont été effectués sur l'ordinateur du Centre Inter Régional de Calcul Electronique du C.N.R.S., F-91405 ORSAY (FRANCE)

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| TABLE DES MATIERES | page | TABLE OF CONTENTS | page |
|---|------|--|------|
| Avertissement | 5 | Foreword | 5 |
| Données sur les Satellites Galiléens | 7 | Data on the Galilean Satellites | 7 |
| Présentation des éphémérides | 9 | Presentation of the ephemerides | 9 |
| Phénomènes et configurations pour 1989 | 15 | Phenomena and configurations for 1989 | 15 |
| Phénomènes pour 1990 | 65 | Phenomena for 1990 | 65 |

AVERTISSEMENT

Depuis 1985, un supplément à la Connaissance des Temps est publié et donne les positions des satellites galiléens de Jupiter, des huit premiers satellites de Saturne et des cinq satellites d'Uranus sous forme de fonctions mixtes avec une précision proche des théories originales. Une disquette pour micro-ordinateur accompagne cet ouvrage.

Cependant, des observateurs ont souhaité continuer à disposer d'un ouvrage permettant d'identifier les satellites galiléens et de connaître les instants des phénomènes présentés par ces satellites et calculés à une seconde de temps près. C'est ce que donne le présent fascicule. En particulier, les configurations précises permettent très facilement de situer les satellites avec une précision de 10" par rapport à Jupiter.

On trouvera de plus des renseignements généraux sur les satellites galiléens en début d'ouvrage ainsi qu'une méthode de calcul des phénomènes pour l'année suivante en fin d'ouvrage.

FOREWORD

Since 1985, a supplement to the Connaissance des Temps is published and gives the positions of the Galilean Satellites of Jupiter, of the First Eight Satellites of Saturn and of the Five Satellites of Uranus under a mixed form of representation, involving secular and periodic terms and depending directly on time. The accuracy is near that of the original theories. A floppy disk is available with these ephemerides.

However, observers wish to keep ephemerides allowing to identify immediately the galilean satellites and to know the dates of the phenomena which are calculated to the nearest second of time. This is given by the present booklet, particularly the configurations giving positions with an accuracy of 10" relatively to Jupiter.

Besides these informations, the present booklet gives various data concerning the galilean satellites. We also present a method which permits the calculation of the phenomena for the next year.

J.-E. ARLOT

W. THUILLOT

Responsables de la publication

Phénomènes et Configurations des satellites galiléens de Jupiter
Supplément à la Connaissance des Temps à l'usage des observateurs.

Rédaction et calculs : Th. DEROUAZI, D.T. VU, Ch. RUATTI

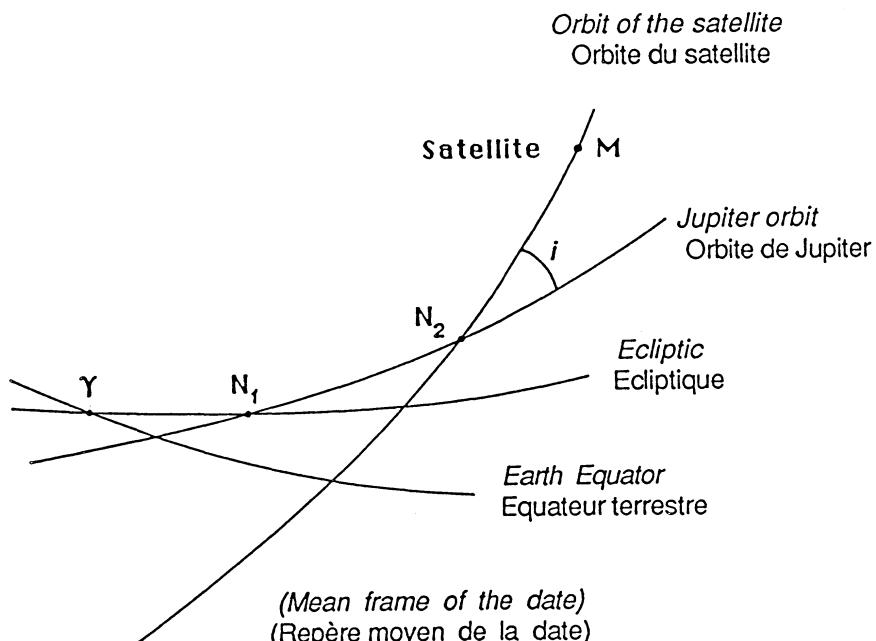
DONNEES SUR LES SATELLITES GALILEENS

DATA ON THE GALILEAN SATELLITES

| | IO (I) | EUROPE (II) | GANYMEDE (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 |
| Pionner 11 (1976) : | 4.68 | 2.52 | 7.80 | 5.66 |
| Rayons (km) | | | | |
| Danjon (1954) : | 1650 | 1400 | 2450 | 2300 |
| Dollfus (1961) : | 1775 | 1550 | 2800 | 2525 |
| Pioneer 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 1989.5 (minutes et secondes de degré) | | | | |
| Sampson (1921) | 2° 02" | 26° 20" | 10° 59" | 21° 00" |
| Valeur moyenne de l'excentricité pour 1989.5 | | | | |
| Sampson (1921) | 0.004 | 0.009 | 0.001 | 0.007 |
| Partie séculaire du mouvement (degré par an) | | | | |
| noeud : | - 48.5 | - 11.9 | - 2.6 | - 0.6 |
| périjove : | 57.0 | 14.6 | 2.7 | 0.7 |
| Sampson (1921) | | | | |

THEORIE DU MOUVEMENT
DES SATELLITES GALILEENS

THEORY OF THE MOTION OF
THE GALILEAN SATELLITES



Du fait de la complexité du mouvement des satellites galiléens, il est difficile de donner des valeurs précises pour les noeuds et les périodes. En effet, les excentricités et les inclinaisons sont faibles (cf. tableau précédent) et tous ces éléments sont soumis à de grandes variations (Thuillot, Vu, 1985).

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 :

$$\gamma_{N_1 N_2} = 316.051^\circ + 0.00003559 \tau, \quad i = 3.10350^\circ$$

| | $\gamma_{N_1 N_2}$ | Période sidéral en jours |
|----------|--|--------------------------|
| | | Sidereal period in days |
| | $\gamma_{N_1 N_2}$ | |
| | $\gamma_{N_1 N_2}$ | |
| Io | $142.59987^\circ + 203.488992435 \tau$ | 1.7691374639 |
| Europe | $99.55081^\circ + 101.374761672 \tau$ | 3.5511797420 |
| Ganymede | $168.02628^\circ + 50.317646290 \tau$ | 7.1545476894 |
| Callisto | $234.40790^\circ + 21.571109630 \tau$ | 16.6889884746 |

PRESENTATION DES EPHÉMERIDES

PRESENTATION OF THE EPHÉMERIDES

ECHELLES DE TEMPS

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

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

Les événements astronomiques étant mesurés dans l'échelle UTC (temps universel coordonné), le tableau ci-dessous donne la relation entre TDT et UTC (d'après la relation entre TAI et UTC publiée par le BIH).

TDT-UTC

| | |
|--|---------|
| du 1 juillet 1983 au 1 juillet 1985 | 54,184s |
| du 1 juillet 1985 au 1 janvier 1988 : | 55,184s |
| à partir du 1 janvier 1988 | 56,184s |

TIME-SCALES

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

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

Astronomical events are measured in the time-scale UTC (coordinate universal time). The table below gives the correspondence between TDT and UTC (using the relationship between TAI and UTC published by the BIH).

TDT-UTC

| | |
|---|---------|
| From July 1, 1983 to July 1, 1985 | 54,184s |
| From July 1, 1985 to January 1, 1988 | 55,184s |
| From January 1, 1988 | 56,184s |

PHENOMENES DES SATELLITES GALILEENS

Les hypothèses utilisées pour le calcul des époques des phénomènes sont les suivantes :

- Jupiter est un ellipsoïde dont l'aplatissement a pour valeur 1/15 et dont le rayon équatorial est 71420 km.

- Les satellites sont des sphères de rayons : 1840 km pour Io, 1552 km pour Europe, 2650 km pour Ganymède, 2420 km pour Callisto (d'après Pionnier 11).

- Le Soleil est une sphère de rayon 695980 km.

- Les dates sont données pour tout observatoire terrestre puisqu'on peut négliger l'effet de parallaxe dont la grandeur est plus faible que la précision des prédictions.

PHENOMENA OF THE GALILEAN SATELLITES

The hypothesis made for the calculations of the dates of the phenomena are :

- Jupiter is an ellipsoid the flatness of which is 1/15 and the equatorial radius of which is 71420 km.

- The satellites are spheres the radius of which are : 1840 km for Io, 1552 km for Europe, 2650 km for Ganymede and 2420 km for Callisto (from Pionner 11).

- The Sun is a sphere the radius of which is 695980 km.

- The dates are given for everywhere on Earth since no parallax effect has to be taken into account.

- L'effet de phase sur les satellites est négligé, mais pris en compte pour la planète.

Les pages paires fournissent les dates des phénomènes que présentent ces satellites :

. les débuts et fins des passages des satellites devant la planète :

PA.D.INT et PA.D.EXT
PA.F.INT et PA.F.EXT

. les débuts et fins de leurs occultations (anciennement appelées immersions et émersions) :

OC.D.INT et OC.D.EXT
OC.F.INT et OC.F.EXT

. les débuts et fins des passages de leur ombre sur Jupiter :

OM.D.INT et OM.D.EXT
OM.F.INT et OM.F.EXT

. les débuts et fins des éclipses des satellites par Jupiter :

EC.D.INT, EC.D.EXT, EC.D.PEN
EC.F.INT, EC.F.EXT, EC.F.PEN

Les notations utilisées sont les suivantes :

.D et .F désignent le début et la fin.

.INT désigne les contacts intérieurs des satellites avec le cône d'ombre pour les éclipses et les passages des ombres sur Jupiter, et désigne les mêmes contacts avec le cône de visibilité pour les occultations et les passages devant la planète.

.EXT désigne les contacts extérieurs des satellites avec le cône d'ombre pour les éclipses et les passages des ombres sur Jupiter, et désigne les mêmes contacts avec le cône de visibilité pour les occultations et les passages devant la planète.

.PEN désignent uniquement pour les éclipses, le contact extérieur des satellites avec le cône de pénombre.

- The phase defect on the satellites is neglected but taken into account for Jupiter.

Even pages give the dates of the phenomena :

. The beginnings and the ends of the transits of the satellites in front of Jupiter :

PA.D.INT and PA.D.EXT
PA.F.INT and PA.F.EXT

. The beginnings and the ends of the occultations of the satellites by Jupiter :

OC.D.INT and OC.D.EXT
OC.F.INT and OC.F.EXT

. The beginnings and the ends of the transits of the umbrage of the satellites on the disk of Jupiter :

OM.D.INT and OM.D.EXT
OM.F.INT and OM.F.EXT

. The beginnings and the ends of the eclipses of the satellites by Jupiter :

EC.D.INT, EC.D.EXT, EC.D.PEN
EC.F.INT, EC.F.EXT, EC.F.PEN

The notations means :

.D and .F mean beginning and end.

.INT means :

- interior contact satellite/shadow cone for the eclipses and transits of shadows on Jupiter.
- interior contact satellite/cone of visibility for the occultations and the transits.

.EXT means :

- exterior contact satellite/shadow cone for the eclipses and transits of shadows on Jupiter
- exterior contact satellite/cone of visibility for the occultations and the transits.

.PEN means :

- exterior contact satellite/penumbra cone for the eclipses

EXEMPLE

Le déroulement d'un début d'éclipse se fait ainsi :

EC.D.PEN : contact extérieur du satellite avec le cône de pénombre (début de l'assombrissement).

EC.D.EXT : contact extérieur avec le cône d'ombre.

EC.D.INT : contact intérieur avec le cône d'ombre (assombrissement total).

EXAMPLE

A beginning of an eclipse occurs as follows :

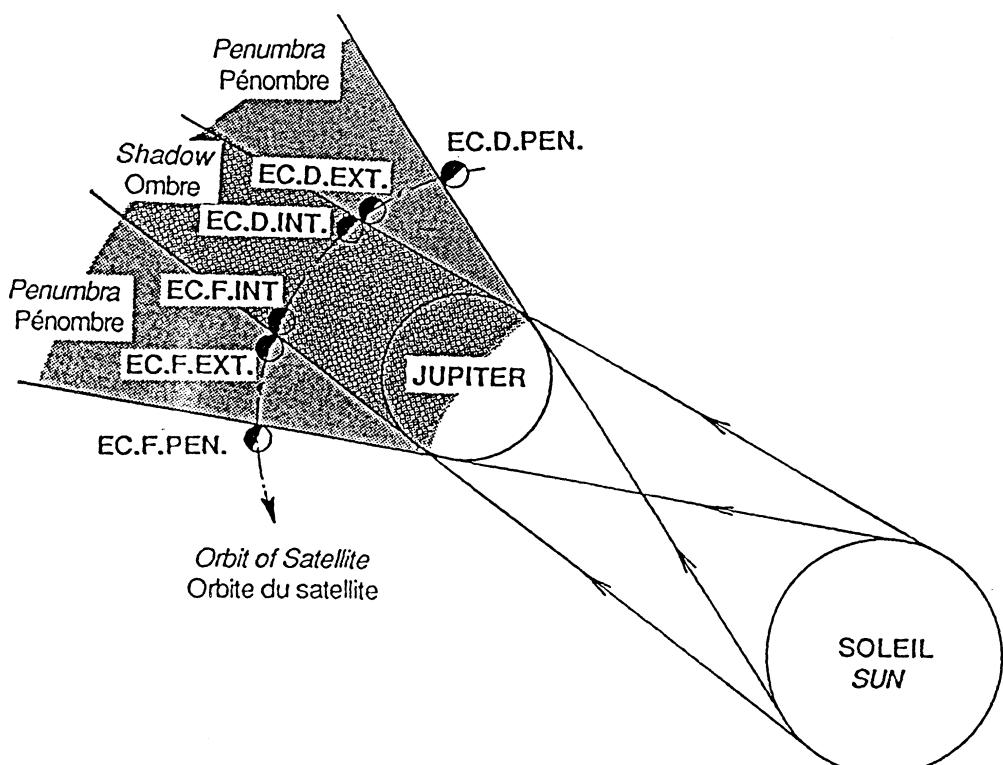
EC.D.PEN : external contact of the satellite with the cone of penumbra (beginning of the penumbra).

EC.D.EXT : external contact with the shadow cone.

EC.D.INT : internal contact with the shadow cone (the satellite has disappeared in the umbra).

On observera que les éclipses se produisent à l'ouest ou à l'est de la planète, suivant que l'on est avant ou après l'opposition. En général pour le premier et le deuxième satellite, on ne peut, avant l'opposition, observer que le début des éclipses suivi de la fin des occultations. Après l'opposition on ne peut observer que le début des occultations suivie de la fin des éclipses. Il est possible, d'autre part, que, en raison de l'inclinaison de l'équateur de Jupiter sur l'écliptique et de l'éloignement du satellite IV Callisto par rapport à la planète, aucun phénomène de ce satellite ne se produise.

Note that the eclipses occur west of the planet before the opposition of with Jupiter the Sun and east after the opposition. Most of time for the first and the second satellite, only the beginning of the eclipse followed by the end of the occultation are observable. On the other hand, it may happen that no phenomenon occurs for satellite IV because it is far from Jupiter and because of the inclination of the equator of Jupiter above the ecliptic.



LES CONFIGURATIONS

Les configurations permettent d'identifier les satellites, et également de déterminer leur position en coordonnées tangentielles équatoriales relatives à Jupiter avec la précision suivante (pour une lecture des courbes à 0,5 mm près) :

- . Satellite 1 : de 5" à 20" selon la vitesse apparente
 - . Satellite 2 : de 5" à 10" selon la vitesse apparente
 - . Satellites 3 et 4 : 5"

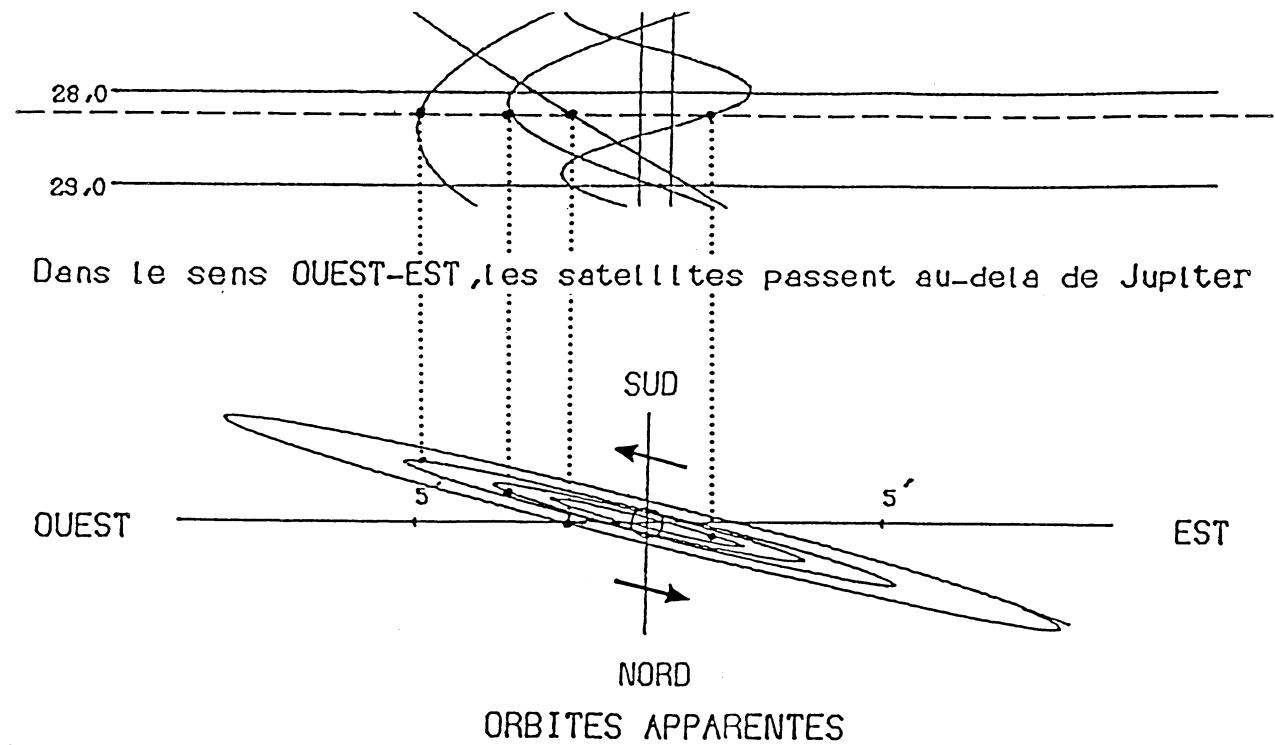
L'exemple suivant montre comment déterminer les positions des satellites :

THE CONFIGURATIONS

The configurations permit to identify the satellites and to approach their positions relative to Jupiter in an equatorial tangential frame with the following precision (corresponding to a measure on the curves with an accuracy of 0,5 millimeter).

- . Satellite 1 : from 5" to 20" depending on the apparent velocity
 - . Satellite 2 : from 5" to 10" depending on the apparent velocity
 - . Satellites 3 and 4: 5"

The following example shows how to determine the positions of the satellites :



On reporte en abscisse sur l'axe ouest-est les distances $\Delta a \cos \delta$ mesurées pour une date voulue, sur les courbes. L'ordonnée est donnée par les orbites apparentes. L'indétermination avant/arrière est levée grâce au sens de rotation des satellites.

For the abscissae, we have to project the differential coordinate $\Delta\alpha \cos \delta$ measured on the curves for a determined date on the East-West axis. For the ordinates, we have to project these abscissae on the apparent orbits as indicated on the figure. The front/back indetermination is removed thanks to the direction of the rotation of the satellites.

CALCULS DES PHENOMENES POUR 1990

Les prédictions des phénomènes des satellites galiléens sont données suivant une représentation polynomiale en fonction d'une variable temporelle. La méthode (Thuillot, 1983) permet une représentation compacte puisque 7 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 67 à 69.

CALCULATIONS OF THE DATES
OF THE PHENOMENA FOR 1990

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 7 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 67 to 69.

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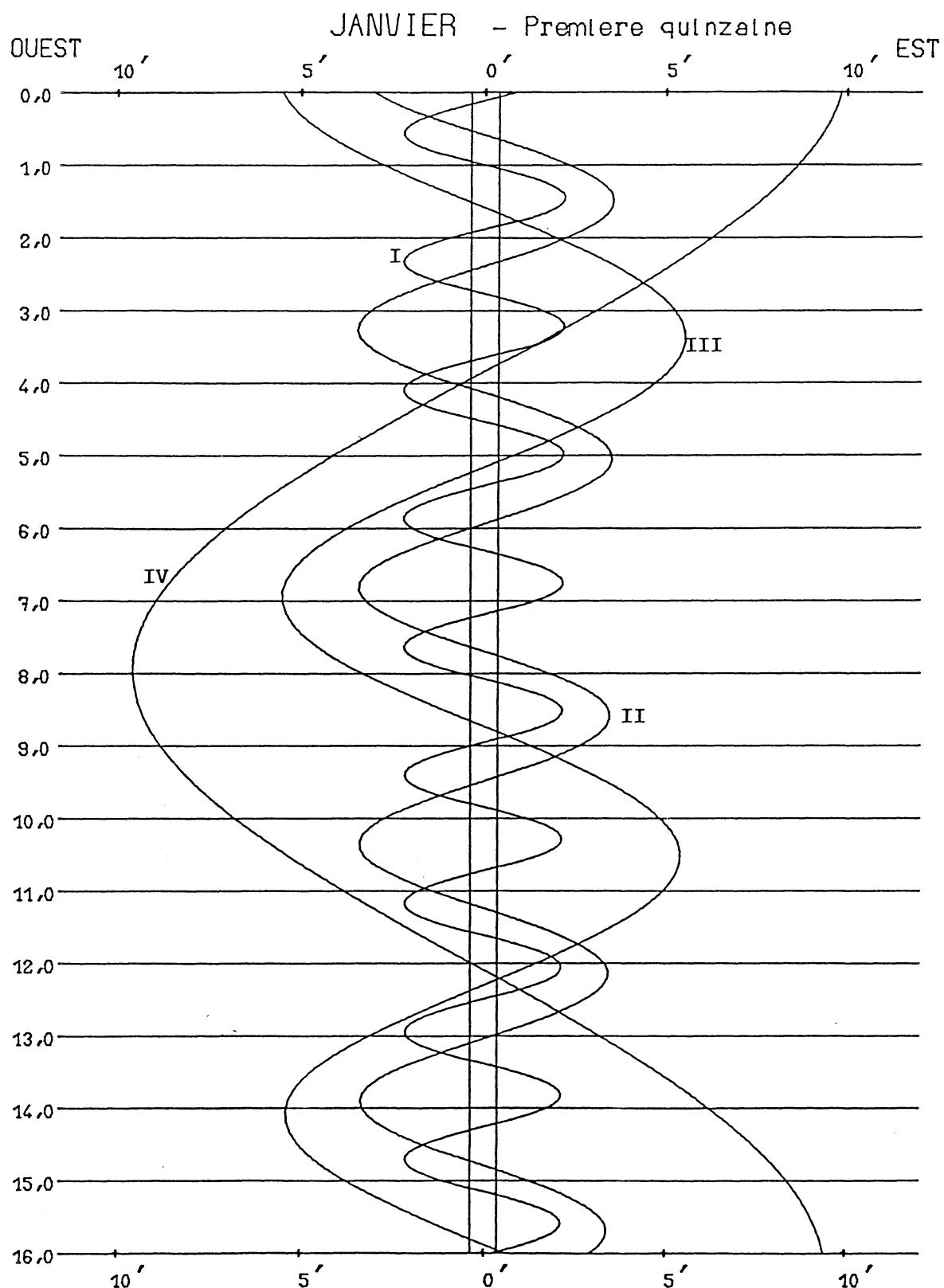
ÉPHÉMÉRIDES

**Phénomènes et configurations
pour 1989**

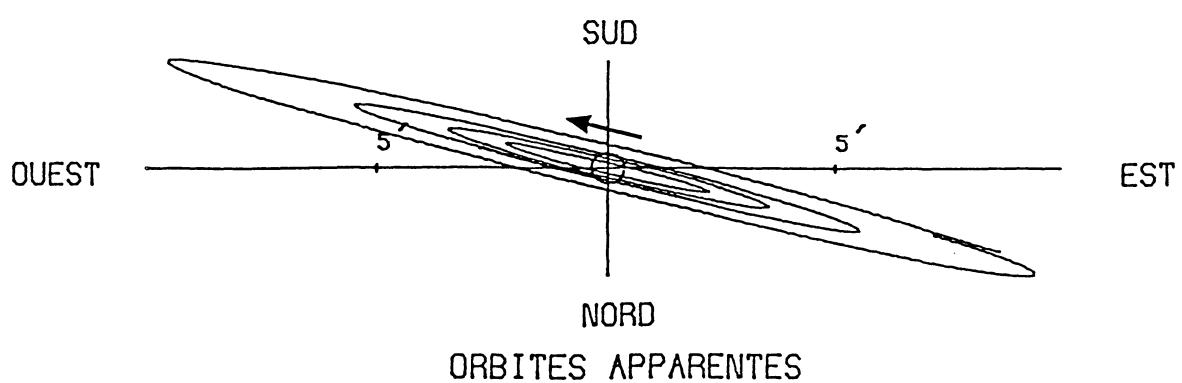
16.

1989 - SATELLITES DE JUPITER -

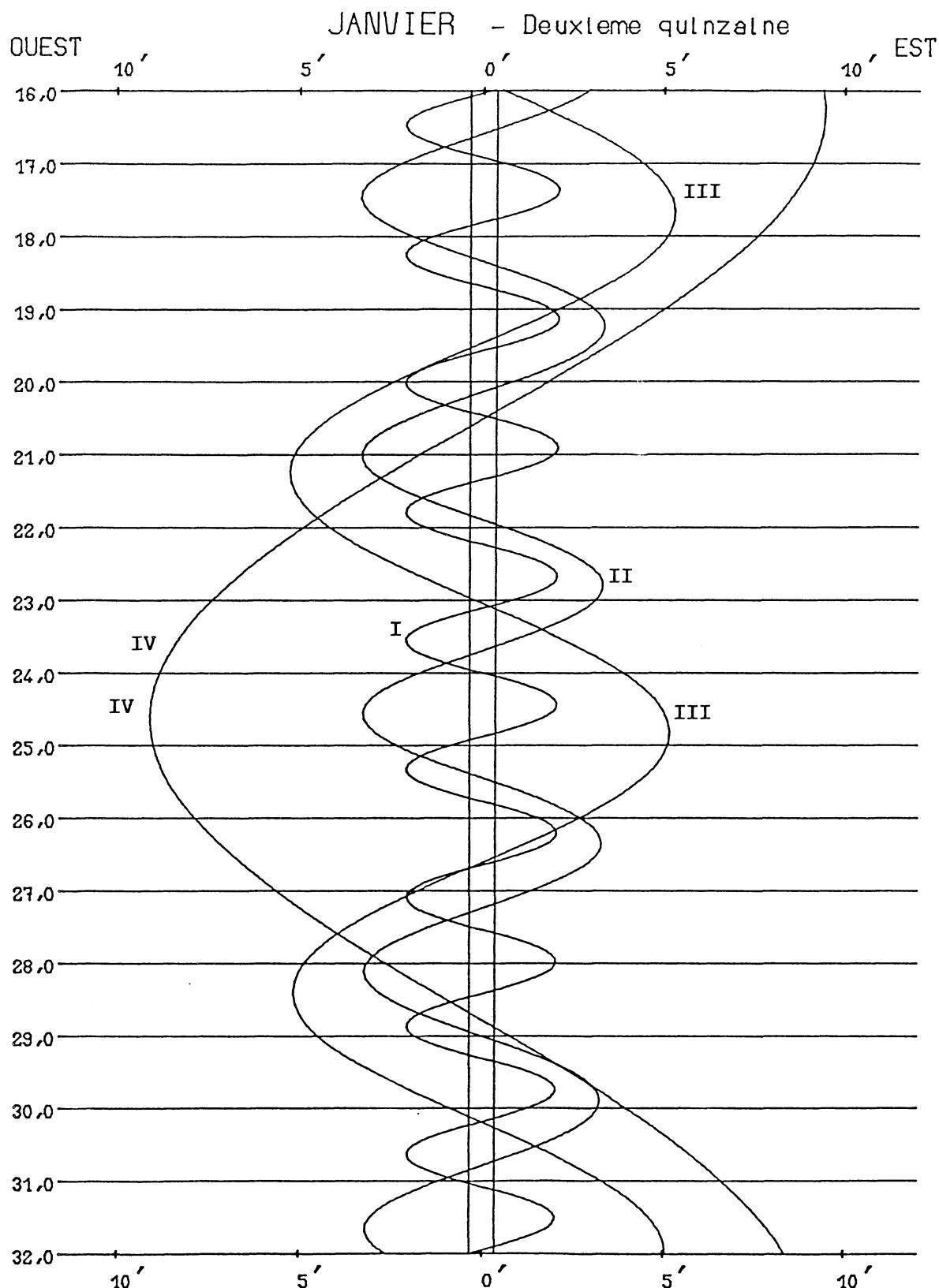
| PHENOMENES | | | | | | MOIS : | | | JANVIER - PREMIERE QUINZAINE - | | | | | | | | | |
|------------|----|----|----|-----|----------|--------|----|----|--------------------------------|----------|----------|------|----|----|-----|----------|----------|----------|
| JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE | |
| 0 | 1 | 41 | 21 | I | PA.D.EXT | 6 | 34 | 19 | III | OM.D.INT | | 10 | 16 | 24 | 9 | I | PA.D.EXT | |
| | 1 | 45 | 12 | I | PA.D.INT | 8 | 38 | 52 | III | OM.F.INT | | | 16 | 27 | 59 | I | PA.D.INT | |
| | 2 | 34 | 15 | I | OM.D.EXT | 8 | 52 | 18 | III | OM.F.EXT | | | 17 | 27 | 28 | I | OM.D.EXT | |
| | 2 | 38 | 5 | I | OM.D.INT | 9 | 2 | 25 | I | PA.D.EXT | | | 17 | 31 | 18 | I | OM.D.INT | |
| | 3 | 50 | 34 | I | PA.F.INT | 9 | 6 | 15 | I | PA.D.INT | | | 18 | 33 | 28 | I | PA.F.INT | |
| | 3 | 54 | 25 | I | PA.F.EXT | 10 | 0 | 52 | I | OM.D.EXT | | | 18 | 37 | 18 | I | PA.F.EXT | |
| | 4 | 44 | 57 | I | OM.F.INT | 10 | 4 | 42 | I | OM.D.INT | | | 19 | 38 | 4 | I | OM.F.INT | |
| | 4 | 48 | 46 | I | OM.F.EXT | 11 | 11 | 42 | I | PA.F.INT | | | 19 | 41 | 53 | I | OM.F.EXT | |
| | 12 | 59 | 18 | II | OC.D.EXT | 11 | 15 | 32 | I | PA.F.EXT | | | | | | | | |
| | 13 | 4 | 13 | II | OC.D.INT | 12 | 11 | 31 | I | OM.F.INT | | 11 | 4 | 33 | 40 | II | OC.D.EXT | |
| | 17 | 7 | 26 | II | EC.F.INT | 12 | 15 | 20 | I | OM.F.EXT | | | 4 | 38 | 33 | II | OC.D.INT | |
| | 17 | 12 | 18 | II | EC.F.EXT | 21 | 16 | 55 | II | PA.D.EXT | | | 9 | 3 | 57 | II | EC.F.INT | |
| | 17 | 14 | 13 | II | EC.F.PEN | 21 | 21 | 47 | II | PA.D.INT | | | 9 | 8 | 48 | II | EC.F.EXT | |
| | 23 | 0 | 51 | I | OC.D.EXT | 23 | 14 | 23 | II | OM.D.EXT | | | 9 | 10 | 42 | II | EC.F.PEN | |
| | 23 | 4 | 41 | I | OC.D.INT | 23 | 19 | 9 | II | OM.D.INT | | | 13 | 43 | 29 | I | OC.D.EXT | |
| | | | | | | 23 | 33 | 30 | II | PA.F.INT | | | 13 | 47 | 19 | I | OC.D.INT | |
| 1 | 2 | 5 | 37 | I | EC.F.INT | 23 | 38 | 22 | II | PA.F.EXT | | | 16 | 58 | 32 | I | EC.F.INT | |
| | 2 | 9 | 26 | I | EC.F.EXT | | | | | | | 17 | 2 | 21 | I | EC.F.EXT | | |
| | 2 | 10 | 14 | I | EC.F.PEN | 6 | 1 | 35 | 12 | II | OM.F.INT | | | 17 | 3 | 9 | I | EC.F.PEN |
| | 12 | 40 | 16 | III | OC.D.EXT | 1 | 39 | 57 | II | OM.F.EXT | | 12 | 5 | 59 | 57 | III | PA.D.EXT | |
| | 12 | 54 | 52 | III | OC.D.INT | 6 | 21 | 52 | I | OC.D.EXT | | | 6 | 13 | 55 | III | PA.D.INT | |
| | 14 | 48 | 2 | III | OC.F.INT | 6 | 25 | 42 | I | OC.D.INT | | | 8 | 10 | 15 | III | PA.F.INT | |
| | 15 | 2 | 38 | III | OC.F.EXT | 9 | 32 | 6 | I | EC.F.INT | | | 8 | 24 | 20 | III | PA.F.EXT | |
| | 16 | 21 | 8 | III | EC.D.PEN | 9 | 35 | 55 | I | EC.F.EXT | | | 10 | 21 | 36 | III | OM.D.EXT | |
| | 16 | 26 | 1 | III | EC.D.EXT | 9 | 36 | 43 | I | EC.F.PEN | | | | | | | | |
| | 16 | 40 | 22 | III | EC.D.INT | | | | | | | 10 | 35 | 4 | III | OM.D.INT | | |
| | 18 | 34 | 44 | III | EC.F.INT | 7 | 3 | 29 | 33 | I | PA.D.EXT | | | 10 | 51 | 35 | I | PA.D.EXT |
| | 18 | 49 | 6 | III | EC.F.EXT | 3 | 33 | 23 | I | PA.D.INT | | | 10 | 55 | 25 | I | PA.D.INT | |
| | 18 | 53 | 59 | III | EC.F.PEN | 4 | 29 | 41 | I | OM.D.EXT | | | 11 | 56 | 23 | I | OM.D.EXT | |
| | 20 | 8 | 20 | I | PA.D.EXT | 4 | 33 | 31 | I | OM.D.INT | | | 12 | 0 | 13 | I | OM.D.INT | |
| | 20 | 12 | 10 | I | PA.D.INT | 5 | 38 | 50 | I | PA.F.INT | | | 12 | 40 | 12 | III | OM.F.INT | |
| | 21 | 3 | 9 | I | OM.D.EXT | 5 | 42 | 40 | I | PA.F.EXT | | | 12 | 53 | 32 | III | OM.F.EXT | |
| | 21 | 6 | 59 | I | OM.D.INT | 6 | 40 | 19 | I | OM.F.INT | | | 13 | 0 | 55 | I | PA.F.INT | |
| | 22 | 17 | 34 | I | PA.F.INT | 6 | 44 | 8 | I | OM.F.EXT | | | 13 | 4 | 46 | I | PA.F.EXT | |
| | 22 | 21 | 25 | I | PA.F.EXT | 15 | 21 | 43 | II | OC.D.EXT | | | 14 | 6 | 58 | I | OM.F.INT | |
| | 23 | 13 | 50 | I | OM.F.INT | 15 | 26 | 37 | II | OC.D.INT | | | 14 | 10 | 48 | I | OM.F.EXT | |
| | 23 | 17 | 39 | I | OM.F.EXT | 19 | 45 | 15 | II | EC.F.INT | | | 23 | 40 | 52 | II | PA.D.EXT | |
| | | | | | | 19 | 50 | 7 | II | EC.F.EXT | | | 23 | 45 | 41 | II | PA.D.INT | |
| 2 | 8 | 5 | 57 | II | PA.D.EXT | 19 | 52 | 1 | II | EC.F.PEN | | | | | | | | |
| | 8 | 10 | 49 | II | PA.D.INT | | | | | | | 13 | 1 | 50 | 50 | II | OM.D.EXT | |
| | 9 | 56 | 12 | II | OM.D.EXT | 8 | 0 | 48 | 58 | I | OC.D.EXT | | | 1 | 55 | 34 | II | OM.D.INT |
| | 10 | 0 | 58 | II | OM.D.INT | 0 | 52 | 48 | I | OC.D.INT | | | 1 | 58 | 1 | II | PA.F.INT | |
| | 10 | 22 | 13 | II | PA.F.INT | 4 | 0 | 54 | I | EC.F.INT | | | 2 | 2 | 51 | II | PA.F.EXT | |
| | 10 | 27 | 7 | II | PA.F.EXT | 4 | 4 | 43 | I | EC.F.EXT | | | 4 | 11 | 42 | II | OM.F.INT | |
| | 12 | 17 | 0 | II | OM.F.INT | 4 | 5 | 31 | I | EC.F.PEN | | | 4 | 16 | 25 | II | OM.F.EXT | |
| | 12 | 21 | 45 | II | OM.F.EXT | 16 | 12 | 8 | III | OC.D.EXT | | | 8 | 10 | 54 | I | OC.D.EXT | |
| | 17 | 27 | 47 | I | OC.D.EXT | 16 | 26 | 23 | III | OC.D.INT | | | 8 | 14 | 44 | I | OC.D.INT | |
| | 17 | 31 | 37 | I | OC.D.INT | 18 | 22 | 53 | III | OC.F.INT | | | 11 | 27 | 24 | I | EC.F.INT | |
| | 20 | 34 | 26 | I | EC.F.INT | 18 | 37 | 9 | III | OC.F.EXT | | | 11 | 31 | 13 | I | EC.F.EXT | |
| | 20 | 38 | 16 | I | EC.F.EXT | 20 | 22 | 58 | III | EC.D.PEN | | | 11 | 32 | 1 | I | EC.F.PEN | |
| | 20 | 39 | 3 | I | EC.F.PEN | 20 | 27 | 49 | III | EC.D.EXT | | | | | | | | |
| | | | | | | 20 | 42 | 6 | III | EC.D.INT | | | | | | | | |
| 3 | 14 | 35 | 19 | I | PA.D.EXT | 21 | 56 | 51 | I | PA.D.EXT | | 14 | 5 | 19 | 1 | I | PA.D.EXT | |
| | 14 | 39 | 9 | I | PA.D.INT | 22 | 0 | 41 | I | PA.D.INT | | | 5 | 22 | 51 | I | PA.D.INT | |
| | 15 | 31 | 58 | I | OM.D.EXT | 22 | 37 | 14 | III | EC.F.INT | | | 6 | 25 | 14 | I | OM.D.EXT | |
| | 15 | 35 | 48 | I | OM.D.INT | 22 | 51 | 31 | III | EC.F.EXT | | | 6 | 29 | 4 | I | OM.D.INT | |
| | 16 | 44 | 34 | I | PA.F.INT | 22 | 56 | 22 | III | EC.F.PEN | | | 7 | 28 | 23 | I | PA.F.INT | |
| | 16 | 48 | 25 | I | PA.F.EXT | 22 | 58 | 37 | I | OM.D.EXT | | | 7 | 32 | 13 | I | PA.F.EXT | |
| | 17 | 42 | 38 | I | OM.F.INT | 23 | 2 | 27 | I | OM.D.INT | | | 8 | 35 | 48 | I | OM.F.INT | |
| | | | | I | OM.F.EXT | | | | | | | | 8 | 39 | 37 | I | OM.F.EXT | |
| 4 | 2 | 10 | 1 | II | OC.D.EXT | 9 | 0 | 6 | 9 | I | PA.F.INT | | | 17 | 46 | 43 | II | OC.D.EXT |
| | 2 | 14 | 55 | II | OC.D.INT | 1 | 9 | 14 | I | OM.F.INT | | | 17 | 51 | 35 | II | OC.D.INT | |
| | 6 | 26 | 5 | II | EC.F.INT | 1 | 13 | 3 | I | OM.F.EXT | | | 22 | 23 | 15 | II | EC.F.INT | |
| | 6 | 30 | 56 | II | EC.F.EXT | 10 | 28 | 39 | II | PA.D.EXT | | | 22 | 28 | 6 | II | EC.F.EXT | |
| | 6 | 32 | 50 | II | EC.F.PEN | 10 | 33 | 30 | II | PA.D.INT | | | 22 | 30 | 0 | II | EC.F.PEN | |
| | 11 | 54 | 45 | I | OC.D.EXT | 12 | 32 | 39 | II | OM.D.EXT | | 15 | 2 | 38 | 20 | I | OC.D.EXT | |
| | 11 | 58 | 35 | I | OC.D.INT | 12 | 37 | 24 | II | OM.D.INT | | | 2 | 42 | 10 | I | OC.D.INT | |
| | 15 | 3 | 14 | I | EC.F.INT | 12 | 45 | 31 | II | PA.F.INT | | | 5 | 56 | 13 | I | EC.F.INT | |
| | 15 | 7 | 3 | I | EC.F.EXT | 12 | 50 | 22 | II | PA.F.EXT | | | 6 | 0 | 2 | I | EC.F.EXT | |
| | 15 | 7 | 51 | I | EC.F.PEN | 14 | 53 | 29 | II | OM.F.INT | | | 6 | 0 | 50 | I | EC.F.PEN | |
| | | | | | | 14 | 58 | 13 | II | OM.F.EXT | | | 19 | 48 | 37 | III | OC.D.EXT | |
| 5 | 2 | 26 | 11 | III | PA.D.EXT | 19 | 16 | 12 | I | OC.D.EXT | | | 20 | 2 | 34 | III | OC.D.INT | |
| | 2 | 40 | 30 | III | PA.D.INT | 19 | 20 | 2 | I | OC.D.INT | | | 22 | 2 | 12 | III | OC.F.INT | |
| | 4 | 33 | 44 | III | PA.F.INT | 22 | 29 | 44 | I | EC.F.INT | | | 22 | 16 | 9 | III | OC.F.EXT | |
| | 4 | 48 | 9 | III | PA.F.EXT | 22 | 33 | 33 | I | EC.F.EXT | | | 23 | 46 | 39 | I | PA.D.EXT | |
| | 6 | 20 | 46 | III | OM.D.EXT | 22 | 34 | 21 | I | EC.F.PEN | | | 23 | 50 | 29 | I | PA.D.INT | |



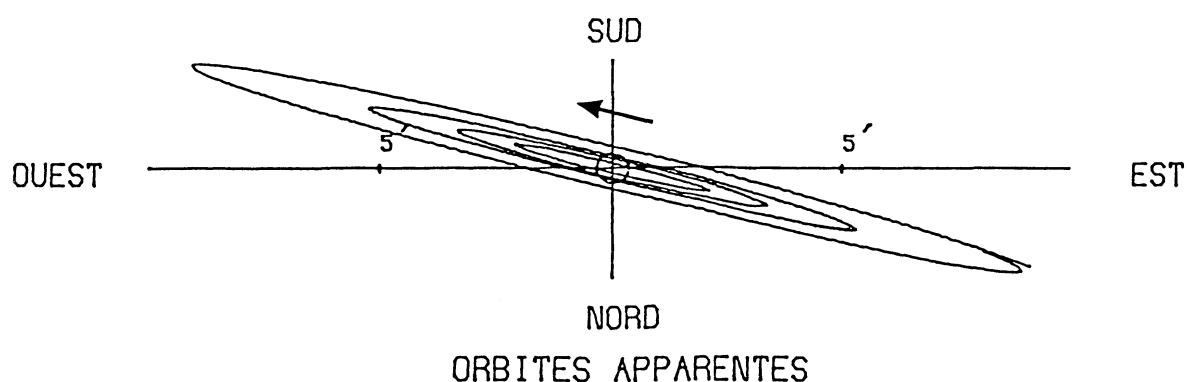
Dans le sens OUEST-EST, les satellites passent au-delà de Jupiter



| PHENOMENES | | | | | MOIS : | | | JANVIER | | | - DEUXIEME QUINZAINE - | | | | | | |
|------------|----------|-----|----------|-----|--------|------|----|---------|-----|----------|------------------------|------|----|----|----|-------|----------|
| JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE |
| 16 | O 24 16 | III | EC.D.PEN | | | 9 | 19 | 14 | | I | PA.F.INT | 16 | 43 | 17 | | I | PA.F.INT |
| | O 29 6 | III | EC.D.EXT | | | 9 | 23 | 4 | | I | PA.F.EXT | 16 | 47 | 7 | | I | PA.F.EXT |
| | O 43 17 | III | EC.D.INT | | | 10 | 31 | 23 | | I | OM.F.INT | 17 | 58 | 13 | | I | OM.F.INT |
| | O 54 11 | I | OM.D.EXT | | | 10 | 35 | 13 | | I | OM.F.EXT | 18 | 2 | 2 | | I | OM.F.EXT |
| | O 58 1 | I | OM.D.INT | | | 20 | 14 | 25 | | II | OC.D.EXT | 18 | 23 | 42 | | III | OM.D.EXT |
| | 1 56 2 | I | PA.F.INT | | | 20 | 19 | 17 | | II | OC.D.INT | 18 | 37 | 3 | | III | OM.D.INT |
| | 1 59 52 | I | PA.F.EXT | | | 22 | 34 | 18 | | II | OC.F.INT | 20 | 43 | 22 | | III | OM.F.INT |
| | 2 39 15 | III | EC.F.INT | | | 22 | 39 | 10 | | II | OC.F.EXT | 20 | 56 | 34 | | III | OM.F.EXT |
| | 2 53 27 | III | EC.F.EXT | | | 22 | 40 | 13 | | II | EC.D.PEN | | | | | | |
| | 2 58 17 | III | EC.F.PEN | | | 22 | 42 | 7 | | II | EC.D.EXT | 27 | 4 | 35 | 54 | II | PA.D.EXT |
| | 3 4 44 | I | OM.F.INT | | | 22 | 46 | 58 | | II | EC.D.INT | 4 | 40 | 39 | | II | PA.D.INT |
| | 3 8 34 | I | OM.F.EXT | | | | | | | | | 6 | 54 | 10 | | II | PA.F.INT |
| | 12 53 48 | II | PA.D.EXT | 22 | 1 | 1 | 29 | | | II | EC.F.INT | 6 | 58 | 56 | | II | PA.F.EXT |
| | 12 58 36 | II | PA.D.INT | | | 1 | 6 | 20 | | II | EC.F.EXT | 7 | 3 | 26 | | II | OM.D.EXT |
| | 15 9 3 | II | OM.D.EXT | | | 1 | 8 | 14 | | II | EC.F.PEN | 7 | 8 | 9 | | II | OM.D.INT |
| | 15 11 14 | II | PA.F.INT | | | 4 | 28 | 58 | | I | OC.D.EXT | 9 | 24 | 30 | | II | OM.F.INT |
| | 15 13 48 | II | OM.D.INT | | | 4 | 32 | 47 | | I | OC.D.INT | 9 | 29 | 11 | | II | OM.F.EXT |
| | 15 16 3 | II | PA.F.EXT | | | 7 | 51 | 34 | | I | EC.F.INT | 11 | 52 | 47 | | I | OC.D.EXT |
| | 17 29 57 | II | OM.F.INT | | | 7 | 55 | 23 | | I | EC.F.EXT | 11 | 56 | 36 | | I | OC.D.INT |
| | 17 34 40 | II | OM.F.EXT | | | 7 | 56 | 10 | | I | EC.F.PEN | 15 | 18 | 6 | | I | EC.F.INT |
| | 21 5 53 | I | OC.D.EXT | | | 23 | 30 | 48 | | III | OC.D.EXT | 15 | 21 | 55 | | I | EC.F.EXT |
| | 21 9 43 | I | OC.D.INT | | | 23 | 44 | 29 | | III | OC.D.INT | 15 | 22 | 42 | | I | EC.F.PEN |
| 17 | O 25 3 | I | EC.F.INT | 23 | 1 | 37 | 44 | | | I | PA.D.EXT | 28 | 9 | 1 | 51 | I | PA.D.EXT |
| | O 28 52 | I | EC.F.EXT | | | 1 | 41 | 34 | | I | PA.D.INT | 9 | 5 | 40 | | I | PA.D.INT |
| | O 29 40 | I | EC.F.PEN | | | 1 | 46 | 59 | | III | OC.F.INT | 10 | 16 | 34 | | I | OM.D.EXT |
| | 18 14 16 | I | PA.D.EXT | | | 2 | 0 | 40 | | III | OC.F.EXT | 10 | 20 | 24 | | I | OM.D.INT |
| | 18 18 6 | I | PA.D.INT | | | 2 | 49 | 50 | | I | OM.D.EXT | 11 | 11 | 23 | | I | PA.F.INT |
| | 19 23 3 | I | OM.D.EXT | | | 2 | 53 | 40 | | I | OM.D.INT | 11 | 15 | 13 | | I | PA.F.EXT |
| | 19 26 53 | I | OM.D.INT | | | 3 | 47 | 13 | | I | PA.F.INT | 12 | 27 | 5 | | I | OM.F.INT |
| | 20 23 40 | I | PA.F.INT | | | 3 | 51 | 3 | | I | PA.F.EXT | 12 | 30 | 54 | | I | OM.F.EXT |
| | 20 27 30 | I | PA.F.EXT | | | 4 | 26 | 0 | | III | EC.D.PEN | 22 | 44 | 47 | | II | OC.D.EXT |
| | 21 33 36 | I | OM.F.INT | | | 4 | 30 | 48 | | III | EC.D.EXT | 22 | 49 | 37 | | II | OC.D.INT |
| | 21 37 26 | I | OM.F.EXT | | | 4 | 44 | 54 | | III | EC.D.INT | | | | | | |
| 18 | 6 59 58 | II | OC.D.EXT | | | 5 | 0 | 22 | | I | OM.F.INT | 29 | 1 | 5 | 26 | II | OC.F.INT |
| | 7 4 50 | II | OC.D.INT | | | 5 | 4 | 11 | | I | OM.F.EXT | | | | | II | OC.F.EXT |
| | 9 19 26 | II | OC.F.INT | | | 6 | 41 | 43 | | III | EC.F.INT | | | | | II | EC.D.PEN |
| | 9 20 56 | II | EC.D.PEN | | | 6 | 55 | 49 | | III | EC.F.EXT | | | | | II | EC.D.EXT |
| | 9 22 51 | II | EC.D.EXT | | | 7 | 0 | 37 | | III | EC.F.PEN | | | | | II | EC.D.INT |
| | 9 24 18 | II | OC.F.EXT | | | 15 | 21 | 18 | | II | PA.D.EXT | | | | | II | EC.F.INT |
| | 9 27 42 | II | EC.D.INT | | | 15 | 26 | 4 | | II | PA.D.INT | | | | | II | EC.F.EXT |
| | 11 42 1 | II | EC.F.INT | | | 17 | 39 | 17 | | II | PA.F.INT | | | | | II | EC.F.PEN |
| | 11 46 52 | II | EC.F.EXT | | | 17 | 44 | 5 | | II | PA.F.EXT | | | | | I | OC.D.EXT |
| | 11 48 46 | II | EC.F.PEN | | | 17 | 45 | 21 | | II | OM.D.EXT | | | | | I | OC.D.INT |
| | 15 33 29 | I | OC.D.EXT | | | 17 | 50 | 4 | | II | OM.D.INT | | | | | I | EC.F.INT |
| | 15 37 18 | I | OC.D.INT | | | 20 | 6 | 20 | | II | OM.F.INT | | | | | I | EC.F.EXT |
| | 18 53 52 | I | EC.F.INT | | | 20 | 11 | 2 | | II | OM.F.EXT | | | | | I | EC.F.PEN |
| | 18 57 41 | I | EC.F.EXT | | | 22 | 56 | 50 | | I | OC.D.EXT | | | | | III | OC.D.EXT |
| | 18 58 29 | I | EC.F.PEN | | | 23 | 0 | 39 | | I | OC.D.INT | 30 | 3 | 17 | 23 | III | OC.D.INT |
| | | | | | | | | | | | | 3 | 30 | 6 | | I | PA.D.EXT |
| 19 | 9 38 49 | III | PA.D.EXT | 24 | 2 | 20 | 25 | | | I | EC.F.INT | | | | | III | OC.D.INT |
| | 9 52 30 | III | PA.D.INT | | | 2 | 24 | 13 | | I | EC.F.EXT | | | | | I | PA.D.INT |
| | 11 51 39 | III | PA.F.INT | | | 2 | 25 | 1 | | I | EC.F.PEN | | | | | I | OM.D.EXT |
| | 12 5 27 | III | PA.F.EXT | | | 20 | 5 | 41 | | I | PA.D.EXT | | | | | I | OM.D.INT |
| | 12 42 2 | I | PA.D.EXT | | | 20 | 9 | 30 | | I | PA.D.INT | | | | | III | OC.F.INT |
| | 12 45 52 | I | PA.D.INT | | | 21 | 18 | 44 | | I | OM.D.EXT | | | | | I | PA.F.INT |
| | 13 52 0 | I | OM.D.EXT | | | 21 | 22 | 34 | | I | OM.D.INT | | | | | I | PA.F.EXT |
| | 13 55 50 | I | OM.D.INT | | | 22 | 19 | 0 | | I | PA.F.EXT | | | | | I | OM.F.INT |
| | 14 22 32 | III | OM.D.EXT | | | 23 | 29 | 15 | | I | OM.F.INT | | | | | I | OM.F.EXT |
| | 14 35 57 | III | OM.D.INT | | | 23 | 33 | 4 | | I | OM.F.EXT | | | | | III | EC.D.PEN |
| | 14 51 27 | I | PA.F.INT | | | | | | | | | | | | | III | EC.D.EXT |
| | 14 55 17 | I | PA.F.EXT | | | 25 | 9 | 29 | 0 | II | OC.D.EXT | | | | | III | EC.D.INT |
| | 16 2 32 | I | OM.F.INT | | | 9 | 33 | 51 | | II | OC.D.INT | | | | | III | EC.F.INT |
| | 16 6 22 | I | OM.F.EXT | | | 11 | 49 | 16 | | II | OC.F.INT | | | | | III | EC.F.EXT |
| | 16 41 39 | III | OM.F.INT | | | 11 | 54 | 7 | | II | OC.F.EXT | | | | | III | EC.F.PEN |
| | 16 54 55 | III | OM.F.EXT | | | 11 | 58 | 54 | | II | EC.D.PEN | | | | | II | PA.D.EXT |
| 20 | 2 7 12 | II | PA.D.EXT | | | 12 | 0 | 48 | | II | EC.D.EXT | | | | | II | PA.D.INT |
| | 2 11 59 | II | PA.D.INT | | | 12 | 5 | 39 | | II | EC.D.INT | | | | | II | PA.F.INT |
| | 4 24 55 | II | PA.F.INT | | | 14 | 20 | 20 | | II | EC.F.INT | | | | | II | PA.F.EXT |
| | 4 27 11 | II | OM.D.EXT | | | 14 | 25 | 10 | | II | EC.F.EXT | | | | | II | OM.D.INT |
| | 4 29 43 | II | PA.F.EXT | | | 14 | 27 | 5 | | II | EC.F.PEN | | | | | II | OM.D.INT |
| | 4 31 55 | II | OM.D.INT | | | 17 | 24 | 44 | | I | OC.D.EXT | | | | | II | OM.F.EXT |
| | 6 48 8 | II | OM.F.INT | | | 17 | 28 | 33 | | I | OC.D.INT | | | | | II | OM.F.EXT |
| | 6 52 50 | II | OM.F.EXT | | | 20 | 49 | 14 | | I | EC.F.INT | | | | | II | OM.F.INT |
| | 10 1 13 | I | OC.D.EXT | | | 20 | 53 | 3 | | I | EC.F.EXT | | | | | I | OC.D.INT |
| | 10 5 3 | I | OC.D.INT | | | 20 | 53 | 50 | | I | EC.F.PEN | | | | | 4 | 15 46 |
| | 13 22 45 | I | EC.F.INT | 26 | 13 | 23 | 1 | | III | PA.D.EXT | | | | | 4 | 19 35 | |
| | 13 26 34 | I | EC.F.EXT | | | 13 | 36 | 27 | | III | PA.D.INT | | | | | 4 | 20 23 |
| | 13 27 21 | I | EC.F.PEN | | | 14 | 33 | 46 | | I | PA.D.EXT | | | | | 21 | 58 21 |
| | 7 9 48 | I | PA.D.EXT | | | 14 | 37 | 35 | | I | PA.D.INT | | | | | 22 | 2 10 |
| | 7 13 37 | I | PA.D.INT | | | 15 | 47 | 41 | | I | OM.D.EXT | | | | | I | PA.D.INT |
| | 8 20 52 | I | OM.D.EXT | | | 15 | 51 | 31 | | I | OM.D.INT | | | | | I | OM.D.INT |
| | 8 24 41 | I | OM.D.INT | | | 15 | 51 | 44 | | III | PA.F.EXT | | | | | I | OM.D.EXT |

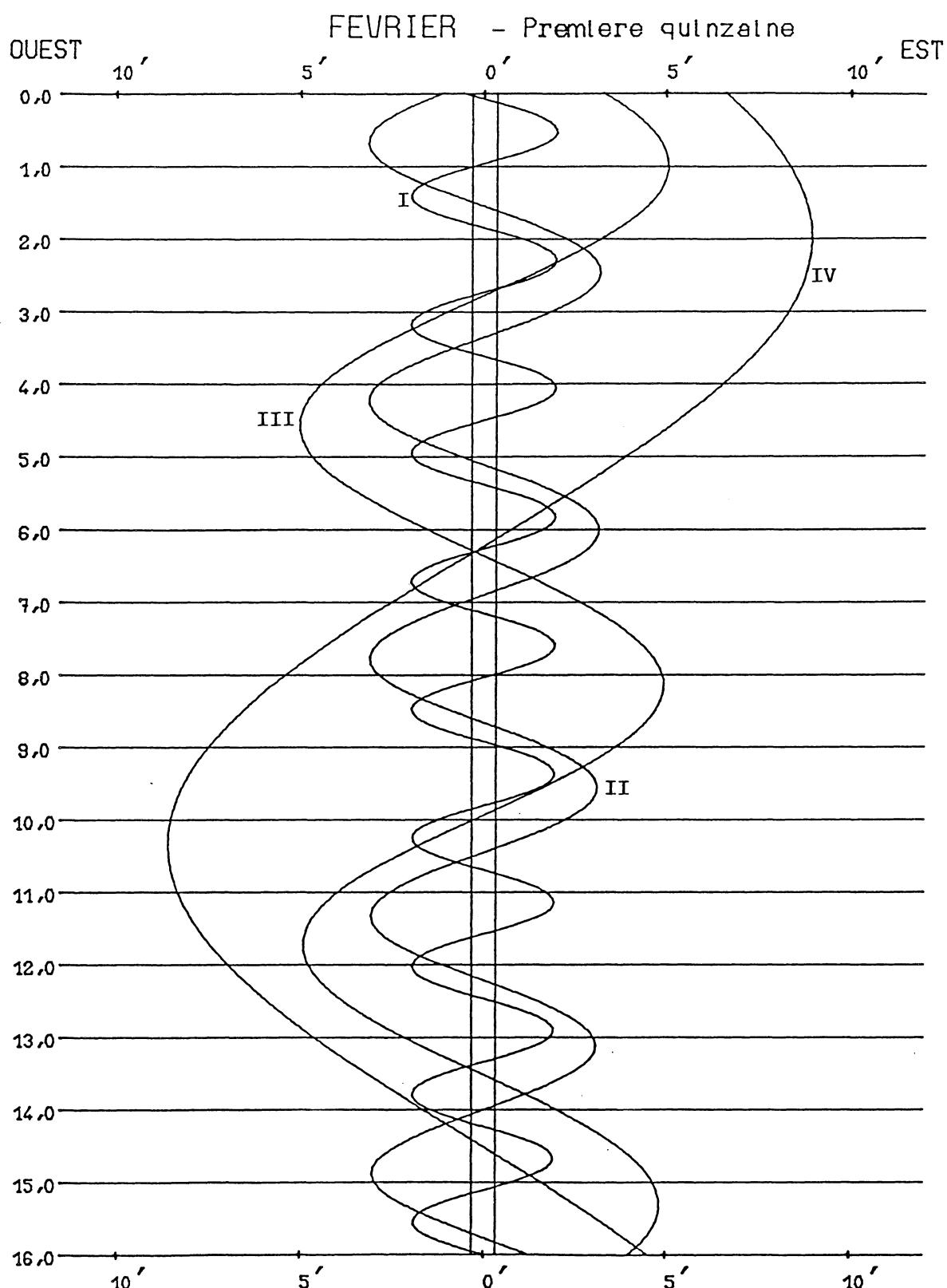


Dans le sens OUEST-EST, les satellites passent au-delà de Jupiter

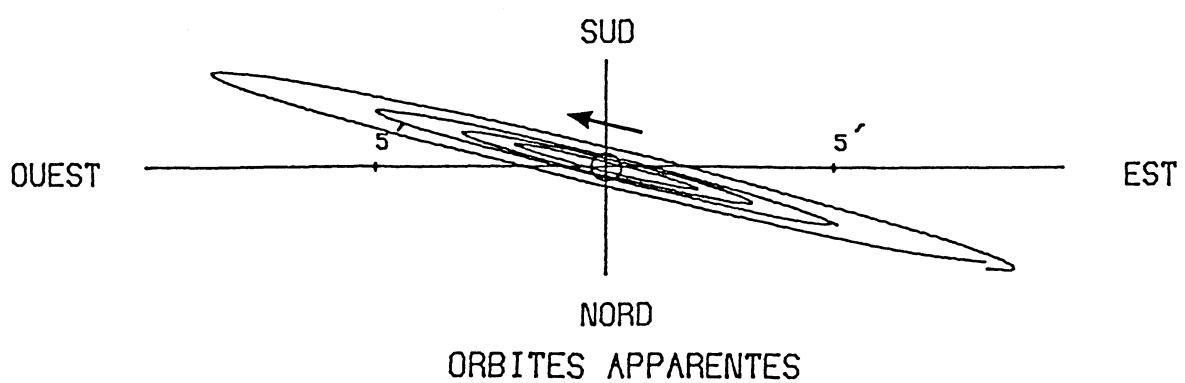


1989 - SATELLITES DE JUPITER -

| PHENOMENES | | | | | | MOIS : | | | FEVRIER - PREMIERE QUINZAINE - | | | | | | | | | |
|------------|----|----|-----|----------|----------|--------|----|----|--------------------------------|----------|----------|----------|----|----|-----|----------|----------|----------|
| JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE | |
| 1 | 0 | 7 | 57 | I | PA.F.INT | 7 | 22 | 5 | III | OC.D.INT | | 19 | 13 | 26 | I | EC.F.PEN | | |
| | 0 | 11 | 47 | I | PA.F.EXT | 7 | 33 | 22 | I | PA.F.INT | | | | | I | PA.D.EXT | | |
| 1 | 24 | 59 | I | OM.F.INT | | 7 | 37 | 12 | I | PA.F.EXT | 11 | 12 | 49 | 34 | I | PA.D.INT | | |
| 1 | 28 | 49 | I | OM.F.EXT | | 8 | 51 | 53 | I | OM.F.INT | | 12 | 53 | 23 | I | OM.D.EXT | | |
| 12 | 0 | 39 | II | OC.D.EXT | | 8 | 55 | 42 | I | OM.F.EXT | | 14 | 8 | 9 | I | OM.D.INT | | |
| 12 | 5 | 28 | II | OC.D.INT | | 9 | 29 | 28 | III | OC.F.INT | | 14 | 11 | 59 | I | PA.F.INT | | |
| 14 | 21 | 39 | II | OC.F.INT | | 9 | 42 | 42 | III | OC.F.EXT | | 14 | 59 | 22 | I | PA.F.EXT | | |
| 14 | 26 | 29 | II | OC.F.EXT | | 12 | 27 | 48 | III | EC.D.PEN | | 15 | 3 | 12 | I | PA.F.EXT | | |
| 14 | 36 | 59 | II | EC.D.PEN | | 12 | 32 | 33 | III | EC.D.EXT | | 16 | 18 | 44 | I | OM.F.INT | | |
| 14 | 38 | 53 | II | EC.D.EXT | | 12 | 46 | 28 | III | EC.D.INT | | 16 | 22 | 33 | I | OM.F.EXT | | |
| 14 | 43 | 43 | II | EC.D.INT | | 14 | 45 | 2 | III | EC.F.INT | | | | | | | | |
| 16 | 58 | 47 | II | EC.F.INT | | 14 | 58 | 57 | III | EC.F.EXT | 12 | 3 | 53 | 15 | II | OC.D.EXT | | |
| 17 | 3 | 37 | II | EC.F.EXT | | 15 | 3 | 42 | III | EC.F.PEN | | 3 | 58 | 3 | II | OC.D.INT | | |
| 17 | 5 | 31 | II | EC.F.PEN | | 20 | 23 | 19 | II | PA.D.EXT | | 6 | 15 | 19 | II | OC.F.INT | | |
| 19 | 17 | 12 | I | OC.D.EXT | | 20 | 28 | 2 | II | PA.D.INT | | 6 | 20 | 7 | II | OC.F.EXT | | |
| 19 | 21 | 1 | I | OC.D.INT | | 22 | 42 | 22 | II | PA.F.INT | | 6 | 34 | 47 | II | EC.D.PEN | | |
| 22 | 44 | 36 | I | EC.F.INT | | 22 | 47 | 6 | II | PA.F.EXT | | 6 | 36 | 41 | II | EC.D.EXT | | |
| 22 | 48 | 24 | I | EC.F.EXT | | 22 | 57 | 40 | II | OM.D.EXT | | 6 | 41 | 31 | II | EC.D.INT | | |
| 22 | 49 | 12 | I | EC.F.PEN | | 23 | 2 | 22 | II | OM.D.INT | | 8 | 57 | 8 | II | EC.F.EXT | | |
| | | | | | | | | | | | | 9 | 1 | 58 | II | EC.F.EXT | | |
| 2 | 16 | 26 | 44 | I | PA.D.EXT | 7 | 1 | 18 | 59 | II | OM.F.INT | | 9 | 3 | 52 | II | EC.F.PEN | |
| | 16 | 30 | 34 | I | PA.D.INT | | 1 | 23 | 38 | II | OM.F.EXT | | 10 | 8 | 5 | I | OC.D.EXT | |
| 17 | 13 | 2 | III | PA.D.EXT | | 2 | 42 | 21 | I | OC.D.EXT | | 10 | 11 | 53 | I | OC.D.INT | | |
| 17 | 26 | 14 | III | PA.D.INT | | 2 | 46 | 9 | I | OC.D.INT | | 13 | 37 | 40 | I | EC.F.INT | | |
| 17 | 43 | 27 | I | OM.D.EXT | | 6 | 11 | 9 | I | EC.F.INT | | 13 | 41 | 28 | I | EC.F.EXT | | |
| 17 | 47 | 17 | I | OM.D.INT | | 6 | 14 | 57 | I | EC.F.EXT | | 13 | 42 | 16 | I | EC.F.PEN | | |
| 18 | 36 | 22 | I | PA.F.INT | | 6 | 15 | 44 | I | EC.F.PEN | | | | | | | | |
| 18 | 40 | 12 | I | PA.F.EXT | | 23 | 52 | 13 | I | PA.D.EXT | 13 | 7 | 18 | 25 | I | PA.D.EXT | | |
| 19 | 30 | 16 | III | PA.F.INT | | 23 | 56 | 2 | I | PA.D.INT | | 7 | 22 | 14 | I | PA.D.INT | | |
| 19 | 43 | 38 | III | PA.F.EXT | | | | | | | | 8 | 37 | 10 | I | OM.D.EXT | | |
| 19 | 53 | 59 | I | OM.F.INT | 8 | 1 | 10 | 16 | I | OM.D.EXT | | 8 | 40 | 59 | I | OM.D.INT | | |
| 19 | 57 | 48 | I | OM.F.EXT | | 1 | 14 | 5 | I | OM.D.INT | | 9 | 28 | 15 | I | PA.F.INT | | |
| 22 | 25 | 40 | III | OM.D.EXT | | 2 | 1 | 57 | I | PA.F.INT | | 9 | 32 | 5 | I | PA.F.EXT | | |
| 22 | 38 | 57 | III | OM.D.INT | | 2 | 5 | 47 | I | PA.F.EXT | | 10 | 47 | 46 | I | OM.F.INT | | |
| | | | | | | | | 3 | 20 | 49 | I | OM.F.INT | | 10 | 51 | 35 | I | OM.F.EXT |
| 3 | 0 | 45 | 57 | III | OM.F.INT | | 3 | 24 | 38 | I | OM.F.EXT | | 11 | 5 | 1 | III | OC.D.EXT | |
| 0 | 59 | 5 | III | OM.F.EXT | | 14 | 34 | 53 | II | OC.D.EXT | | 11 | 18 | 5 | III | OC.D.INT | | |
| 7 | 6 | 57 | II | PA.D.EXT | | 14 | 39 | 42 | II | OC.D.INT | | 13 | 27 | 29 | III | OC.F.INT | | |
| 7 | 11 | 40 | II | PA.D.INT | | 16 | 56 | 37 | II | OC.F.INT | | 13 | 40 | 33 | III | OC.F.EXT | | |
| 9 | 25 | 45 | II | PA.F.INT | | 17 | 1 | 25 | II | OC.F.EXT | | 16 | 28 | 38 | III | EC.D.PEN | | |
| 9 | 30 | 30 | II | PA.F.EXT | | 17 | 15 | 15 | II | EC.D.PEN | | 16 | 33 | 22 | III | EC.D.INT | | |
| 9 | 39 | 38 | II | OM.D.EXT | | 17 | 17 | 9 | II | EC.D.EXT | | 16 | 47 | 12 | III | EC.D.INT | | |
| 9 | 44 | 20 | II | OM.D.INT | | 17 | 21 | 59 | II | EC.D.INT | | 18 | 46 | 38 | III | EC.F.INT | | |
| 12 | 0 | 51 | II | OM.F.INT | | 19 | 37 | 24 | II | EC.F.INT | | 19 | 0 | 28 | III | EC.F.EXT | | |
| 12 | 5 | 31 | II | OM.F.EXT | | 19 | 42 | 14 | II | EC.F.EXT | | 19 | 5 | 12 | III | EC.F.PEN | | |
| 13 | 45 | 32 | I | OC.D.EXT | | 19 | 44 | 8 | II | EC.F.PEN | | 22 | 57 | 36 | II | PA.D.EXT | | |
| 13 | 49 | 21 | I | OC.D.INT | | 21 | 10 | 50 | I | OC.D.EXT | | 23 | 2 | 17 | II | PA.D.INT | | |
| 17 | 13 | 28 | I | EC.F.INT | | 21 | 14 | 38 | I | OC.D.INT | | | | | | | | |
| 17 | 17 | 17 | I | EC.F.EXT | 9 | 0 | 39 | 58 | I | EC.F.INT | 14 | 1 | 17 | 10 | II | PA.F.INT | | |
| 17 | 18 | 4 | I | EC.F.PEN | | 0 | 43 | 46 | I | EC.F.EXT | | 1 | 21 | 53 | II | PA.F.EXT | | |
| | | | | | | | | | I | EC.F.PEN | | 1 | 33 | 41 | II | OM.D.EXT | | |
| 4 | 10 | 55 | 7 | I | PA.D.EXT | | 0 | 44 | 34 | I | EC.F.PEN | | 1 | 38 | 21 | II | OM.D.INT | |
| | 10 | 58 | 56 | I | PA.D.INT | | 18 | 20 | 54 | I | PA.D.EXT | | 3 | 55 | 13 | II | OM.F.INT | |
| 12 | 12 | 20 | I | OM.D.EXT | | 18 | 24 | 43 | I | PA.D.INT | | 3 | 59 | 51 | II | OM.F.EXT | | |
| 12 | 16 | 10 | I | OM.D.INT | | 19 | 39 | 15 | I | OM.D.EXT | | 4 | 36 | 48 | I | OC.D.EXT | | |
| 13 | 4 | 47 | I | PA.F.INT | | 19 | 43 | 5 | I | OM.D.INT | | 4 | 40 | 37 | I | OC.D.INT | | |
| 13 | 8 | 37 | I | PA.F.EXT | | 20 | 30 | 40 | I | PA.F.INT | | 8 | 6 | 30 | I | EC.F.INT | | |
| 14 | 22 | 52 | I | OM.F.INT | | 20 | 34 | 30 | I | PA.F.EXT | | 8 | 10 | 18 | I | EC.F.EXT | | |
| 14 | 26 | 42 | I | OM.F.EXT | | 21 | 7 | 34 | III | PA.D.EXT | | 8 | 11 | 6 | I | EC.F.PEN | | |
| | | | | | | 21 | 20 | 36 | III | PA.D.INT | | | | | | | | |
| 5 | 1 | 17 | 45 | II | OC.D.EXT | | 21 | 49 | 49 | I | OM.F.INT | 15 | 1 | 47 | 14 | I | PA.D.EXT | |
| 1 | 22 | 34 | II | OC.D.INT | | 21 | 53 | 39 | I | OM.F.EXT | | 1 | 51 | 3 | I | PA.D.INT | | |
| 3 | 39 | 8 | II | OC.F.INT | | 23 | 26 | 44 | III | PA.F.INT | | 3 | 6 | 5 | I | OM.D.EXT | | |
| 3 | 43 | 57 | II | OC.F.EXT | | 23 | 39 | 54 | III | PA.F.EXT | | 3 | 9 | 55 | I | OM.D.INT | | |
| 3 | 56 | 26 | II | EC.D.PEN | | | | | | | | 3 | 57 | 7 | I | PA.F.INT | | |
| 3 | 58 | 20 | II | EC.D.EXT | 10 | 2 | 27 | 10 | III | OM.D.EXT | | 4 | 0 | 56 | I | PA.F.EXT | | |
| 4 | 3 | 10 | II | EC.D.INT | | 2 | 40 | 23 | III | OM.D.INT | | 5 | 16 | 42 | I | OM.F.INT | | |
| 6 | 18 | 25 | II | EC.F.INT | | 4 | 48 | 9 | III | OM.F.INT | | 5 | 20 | 32 | I | OM.F.EXT | | |
| 6 | 23 | 16 | II | EC.F.EXT | | 5 | 1 | 12 | III | OM.F.EXT | | 17 | 11 | 33 | II | OC.D.EXT | | |
| 6 | 25 | 10 | II | EC.F.PEN | | 9 | 40 | 11 | II | PA.D.EXT | | 17 | 16 | 20 | II | OC.D.INT | | |
| 8 | 13 | 53 | I | OC.D.EXT | | 9 | 44 | 53 | II | PA.D.INT | | 19 | 33 | 55 | II | OC.F.EXT | | |
| 8 | 17 | 42 | I | OC.D.INT | | 11 | 59 | 30 | II | PA.F.INT | | 19 | 38 | 43 | II | OC.F.EXT | | |
| 11 | 42 | 18 | I | EC.F.INT | | 12 | 4 | 13 | II | PA.F.EXT | | 19 | 53 | 36 | II | EC.D.PEN | | |
| 11 | 46 | 7 | I | EC.F.EXT | | 12 | 15 | 42 | II | OM.D.EXT | | 19 | 55 | 30 | II | EC.D.EXT | | |
| 11 | 46 | 54 | I | EC.F.PEN | | 12 | 20 | 22 | II | OM.D.INT | | 20 | 0 | 19 | II | EC.D.INT | | |
| | | | | | | 14 | 37 | 7 | II | OM.F.INT | | 22 | 16 | 8 | II | EC.F.EXT | | |
| 6 | 5 | 23 | 41 | I | PA.D.EXT | | 14 | 41 | 46 | II | OM.F.EXT | | 22 | 20 | 57 | II | EC.F.EXT | |
| 5 | 27 | 30 | I | PA.D.INT | | 15 | 39 | 27 | I | OC.D.EXT | | 22 | 22 | 51 | II | EC.F.PEN | | |
| 6 | 41 | 21 | I | OM.D.EXT | | 15 | 43 | 16 | I | OC.D.INT | | 23 | 5 | 34 | I | OC.D.EXT | | |
| 6 | 45 | 10 | I | OM.D.INT | | 19 | 8 | 50 | I | EC.F.INT | | 23 | 9 | 22 | I | OC.D.INT | | |
| 7 | 8 | 50 | III | OC.D.EXT | | 19 | 12 | 38 | I | EC.F.EXT | | | | | | | | |



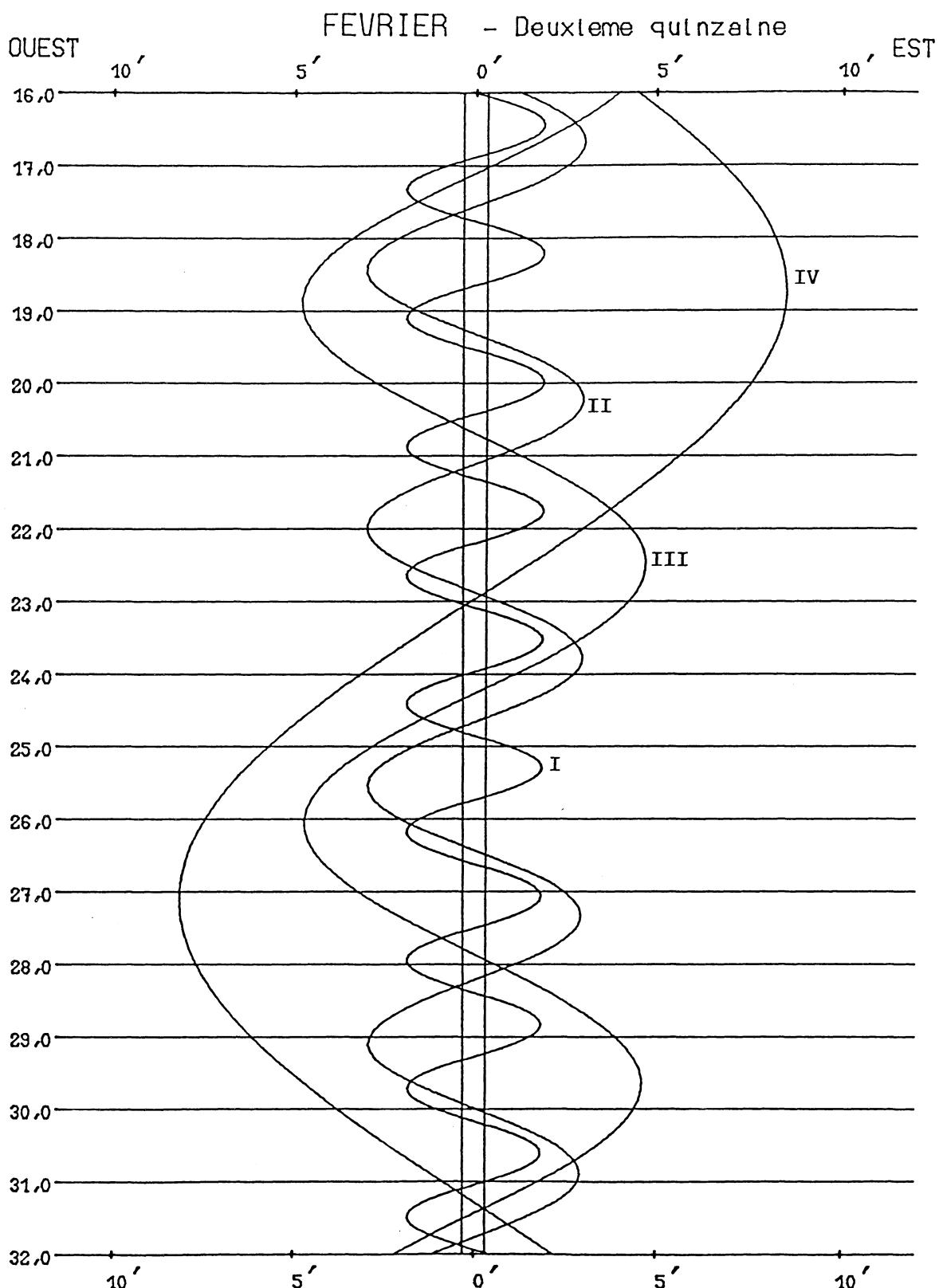
Dans le sens OUEST-EST, les satellites passent au-delà de Jupiter



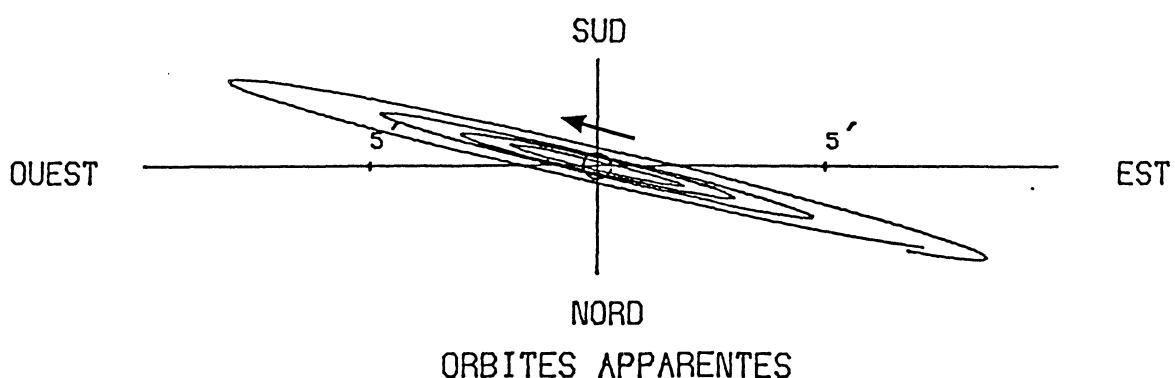
22.

1989 - SATELLITES DE JUPITER -

| PHENOMENES | | | | | | MOIS : | | | FEVRIER - DEUXIEME QUINZAINE - | | | | | | | | |
|------------|----|----|-----|----------|----------|--------|----|-----|--------------------------------|----------|------|------|----|-----|----------|----------|------|
| JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE |
| 16 | 2 | 35 | 19 | I | EC.F.INT | 15 | 18 | 46 | III | OC.D.INT | | 17 | 17 | 44 | II | PA.F.EXT | |
| | 2 | 39 | 7 | I | EC.F.EXT | 17 | 29 | 56 | III | OC.F.INT | | 17 | 27 | 33 | II | OM.D.EXT | |
| | 2 | 39 | 55 | I | EC.F.PEN | 17 | 42 | 52 | III | OC.F.EXT | | 17 | 32 | 12 | II | OM.D.INT | |
| 20 | 16 | 11 | I | PA.D.EXT | 20 | 29 | 36 | III | EC.D.PEN | | 19 | 30 | 25 | I | OC.D.EXT | | |
| 20 | 20 | 0 | I | PA.D.INT | 20 | 34 | 18 | III | EC.D.EXT | | 19 | 34 | 13 | I | OC.D.INT | | |
| 21 | 35 | 5 | I | OM.D.EXT | 20 | 48 | 3 | III | EC.D.INT | | 19 | 49 | 31 | II | OM.F.INT | | |
| 21 | 38 | 55 | I | OM.D.INT | 22 | 48 | 23 | III | EC.F.INT | | 19 | 54 | 8 | II | OM.F.EXT | | |
| 22 | 26 | 7 | I | PA.F.INT | 23 | 2 | 8 | III | EC.F.EXT | | 22 | 59 | 30 | I | EC.F.INT | | |
| 22 | 29 | 56 | I | PA.F.EXT | 23 | 6 | 50 | III | EC.F.PEN | | 23 | 3 | 18 | I | EC.F.EXT | | |
| 23 | 45 | 44 | I | OM.F.INT | | | | | | | 23 | 4 | 6 | I | EC.F.PEN | | |
| 23 | 49 | 33 | I | OM.F.EXT | 21 | 1 | 33 | 53 | II | PA.D.EXT | | | | | | | |
| | | | | | | 1 | 38 | 33 | II | PA.D.INT | 25 | 16 | 41 | 40 | I | PA.D.EXT | |
| 17 | 1 | 7 | 23 | III | PA.D.EXT | 3 | 53 | 58 | II | PA.F.INT | | 16 | 45 | 29 | I | PA.D.INT | |
| 1 | 20 | 15 | III | PA.D.INT | 3 | 58 | 39 | II | PA.F.EXT | | 17 | 59 | 50 | I | OM.D.EXT | | |
| 3 | 28 | 16 | III | PA.F.INT | 4 | 9 | 37 | II | OM.D.EXT | | 18 | 3 | 40 | I | OM.D.INT | | |
| 3 | 41 | 16 | III | PA.F.EXT | 4 | 14 | 16 | II | OM.D.INT | | 18 | 51 | 48 | I | PA.F.INT | | |
| 6 | 29 | 11 | III | OM.D.EXT | 6 | 31 | 25 | II | OM.F.INT | | 18 | 55 | 38 | I | PA.F.EXT | | |
| 6 | 42 | 19 | III | OM.D.INT | 6 | 32 | 18 | I | OC.D.EXT | | 20 | 10 | 37 | I | OM.F.INT | | |
| 8 | 50 | 54 | III | OM.F.INT | 6 | 36 | 3 | II | OM.F.EXT | | 20 | 14 | 26 | I | OM.F.EXT | | |
| 9 | 3 | 52 | III | OM.F.EXT | 6 | 36 | 6 | I | OC.D.INT | | | | | | | | |
| 12 | 15 | 32 | II | PA.D.EXT | 10 | 1 | 50 | I | EC.F.INT | 26 | 9 | 11 | 9 | II | OC.D.EXT | | |
| 12 | 20 | 12 | II | PA.D.INT | 10 | 5 | 38 | I | EC.F.EXT | | 9 | 15 | 56 | II | OC.D.INT | | |
| 14 | 35 | 21 | II | PA.F.INT | 10 | 6 | 26 | I | EC.F.PEN | | 11 | 34 | 26 | II | OC.F.INT | | |
| 14 | 40 | 3 | II | PA.F.EXT | | | | | | | 11 | 39 | 13 | II | OC.F.EXT | | |
| 14 | 51 | 42 | II | OM.D.EXT | 22 | 3 | 43 | 18 | I | PA.D.EXT | | 11 | 51 | 45 | II | EC.D.PEN | |
| 14 | 56 | 22 | II | OM.D.INT | 3 | 47 | 6 | I | PA.D.INT | | 11 | 53 | 38 | II | EC.D.EXT | | |
| 17 | 13 | 22 | II | OM.F.INT | 5 | 1 | 56 | I | OM.D.EXT | | 11 | 58 | 27 | II | EC.D.INT | | |
| 17 | 18 | 0 | II | OM.F.EXT | 5 | 5 | 46 | I | OM.D.INT | | 13 | 59 | 33 | I | OC.D.EXT | | |
| 17 | 34 | 27 | I | OC.D.EXT | 5 | 53 | 20 | I | PA.F.INT | | 14 | 3 | 20 | I | OC.D.INT | | |
| 17 | 38 | 15 | I | OC.D.INT | 5 | 57 | 10 | I | PA.F.EXT | | 14 | 14 | 51 | II | EC.F.INT | | |
| 21 | 4 | 11 | I | EC.F.INT | 7 | 12 | 39 | I | OM.F.INT | | 14 | 19 | 40 | II | EC.F.EXT | | |
| 21 | 7 | 59 | I | EC.F.EXT | 7 | 16 | 28 | I | OM.F.EXT | | 14 | 21 | 33 | II | EC.F.PEN | | |
| 21 | 8 | 46 | I | EC.F.PEN | 19 | 50 | 29 | II | OC.D.EXT | | 17 | 28 | 20 | I | EC.F.INT | | |
| | | | | | | 19 | 55 | 16 | II | OC.D.INT | | 17 | 32 | 8 | I | EC.F.EXT | |
| 18 | 14 | 45 | 7 | I | PA.D.EXT | 22 | 13 | 28 | II | OC.F.INT | | 17 | 32 | 55 | I | EC.F.PEN | |
| 14 | 48 | 56 | I | PA.D.INT | 22 | 18 | 15 | II | OC.F.EXT | | | | | | | | |
| 16 | 3 | 59 | I | OM.D.EXT | 22 | 32 | 3 | II | EC.D.PEN | 27 | 11 | 11 | 0 | I | PA.D.EXT | | |
| 16 | 7 | 49 | I | OM.D.INT | 22 | 33 | 57 | II | EC.D.EXT | | 11 | 14 | 49 | I | PA.D.INT | | |
| 16 | 55 | 5 | I | PA.F.INT | 22 | 38 | 46 | II | EC.D.INT | | 12 | 28 | 51 | I | OM.D.EXT | | |
| 16 | 58 | 54 | I | PA.F.EXT | | | | | | | 12 | 32 | 41 | I | OM.D.INT | | |
| 18 | 14 | 39 | I | OM.F.INT | 23 | 0 | 54 | 57 | II | EC.F.INT | | 13 | 21 | 12 | I | PA.F.INT | |
| 18 | 18 | 28 | I | OM.F.EXT | 0 | 59 | 46 | II | EC.F.EXT | | 13 | 25 | 1 | I | PA.F.EXT | | |
| | | | | | | 1 | 1 | 18 | I | OC.D.EXT | | 14 | 39 | 40 | I | OM.F.INT | |
| 19 | 6 | 31 | 5 | II | OC.D.EXT | 1 | 1 | 40 | II | EC.F.PEN | | 14 | 43 | 29 | I | OM.F.EXT | |
| 6 | 35 | 53 | II | OC.D.INT | 1 | 5 | 6 | I | OC.D.INT | | 19 | 11 | 39 | III | OC.D.EXT | | |
| 8 | 53 | 47 | II | OC.F.INT | 4 | 30 | 39 | I | EC.F.INT | | 19 | 24 | 27 | III | OC.D.INT | | |
| 8 | 58 | 34 | II | OC.F.EXT | 4 | 34 | 27 | I | EC.F.EXT | | 21 | 37 | 9 | III | OC.F.INT | | |
| 9 | 13 | 12 | II | EC.D.PEN | 4 | 35 | 14 | I | EC.F.PEN | | 21 | 49 | 58 | III | OC.F.EXT | | |
| 9 | 15 | 6 | II | EC.D.EXT | 22 | 12 | 30 | I | PA.D.EXT | | | | | | | | |
| 9 | 19 | 55 | II | EC.D.INT | 22 | 16 | 19 | I | PA.D.INT | 28 | 0 | 31 | 23 | III | EC.D.PEN | | |
| 11 | 35 | 56 | II | EC.F.INT | 23 | 30 | 56 | I | OM.D.EXT | | 0 | 36 | 4 | III | EC.D.EXT | | |
| 11 | 40 | 45 | II | EC.F.EXT | 23 | 34 | 46 | I | OM.D.INT | | 0 | 49 | 43 | III | EC.D.INT | | |
| 11 | 42 | 39 | II | EC.F.PEN | | | | | | | 2 | 50 | 58 | III | EC.F.EXT | | |
| 12 | 3 | 20 | I | OC.D.EXT | 24 | 0 | 22 | 36 | I | PA.F.INT | | 3 | 4 | 38 | III | EC.F.EXT | |
| 12 | 7 | 8 | I | OC.D.INT | 0 | 26 | 25 | I | PA.F.EXT | | 3 | 9 | 19 | III | EC.F.PEN | | |
| 15 | 33 | 1 | I | EC.F.INT | 1 | 41 | 41 | I | OM.F.INT | | 4 | 11 | 58 | II | PA.D.EXT | | |
| 15 | 36 | 49 | I | EC.F.EXT | 1 | 45 | 30 | I | OM.F.EXT | | 4 | 16 | 37 | II | PA.D.INT | | |
| 15 | 37 | 36 | I | EC.F.PEN | 5 | 10 | 36 | III | PA.D.EXT | | 6 | 32 | 33 | II | PA.F.INT | | |
| | | | | | | 5 | 23 | 20 | III | PA.D.INT | | 6 | 37 | 13 | II | PA.F.EXT | |
| 20 | 9 | 14 | 13 | I | PA.D.EXT | 7 | 33 | 2 | III | PA.F.INT | | 6 | 45 | 25 | II | OM.D.EXT | |
| 9 | 18 | 2 | I | PA.D.INT | 7 | 45 | 54 | III | PA.F.EXT | | 6 | 50 | 4 | II | OM.D.INT | | |
| 10 | 33 | 0 | I | OM.D.EXT | 10 | 30 | 20 | III | OM.D.EXT | | 8 | 28 | 44 | I | OC.D.EXT | | |
| 10 | 36 | 50 | I | OM.D.INT | 10 | 43 | 24 | III | OM.D.INT | | 8 | 32 | 32 | I | OC.D.INT | | |
| 11 | 24 | 14 | I | PA.F.INT | 12 | 52 | 50 | III | OM.F.INT | | 9 | 7 | 33 | II | OM.F.INT | | |
| 11 | 28 | 3 | I | PA.F.EXT | 13 | 5 | 44 | III | OM.F.EXT | | 9 | 12 | 9 | II | OM.F.EXT | | |
| 12 | 43 | 42 | I | OM.F.INT | 14 | 52 | 44 | II | PA.D.EXT | | 11 | 57 | 9 | I | EC.F.INT | | |
| 12 | 47 | 31 | I | OM.F.EXT | 14 | 57 | 23 | II | PA.D.INT | | 12 | 0 | 57 | I | EC.F.EXT | | |
| 15 | 5 | 51 | III | OC.D.EXT | 17 | 13 | 3 | II | PA.F.INT | | 12 | 1 | 44 | I | EC.F.PEN | | |



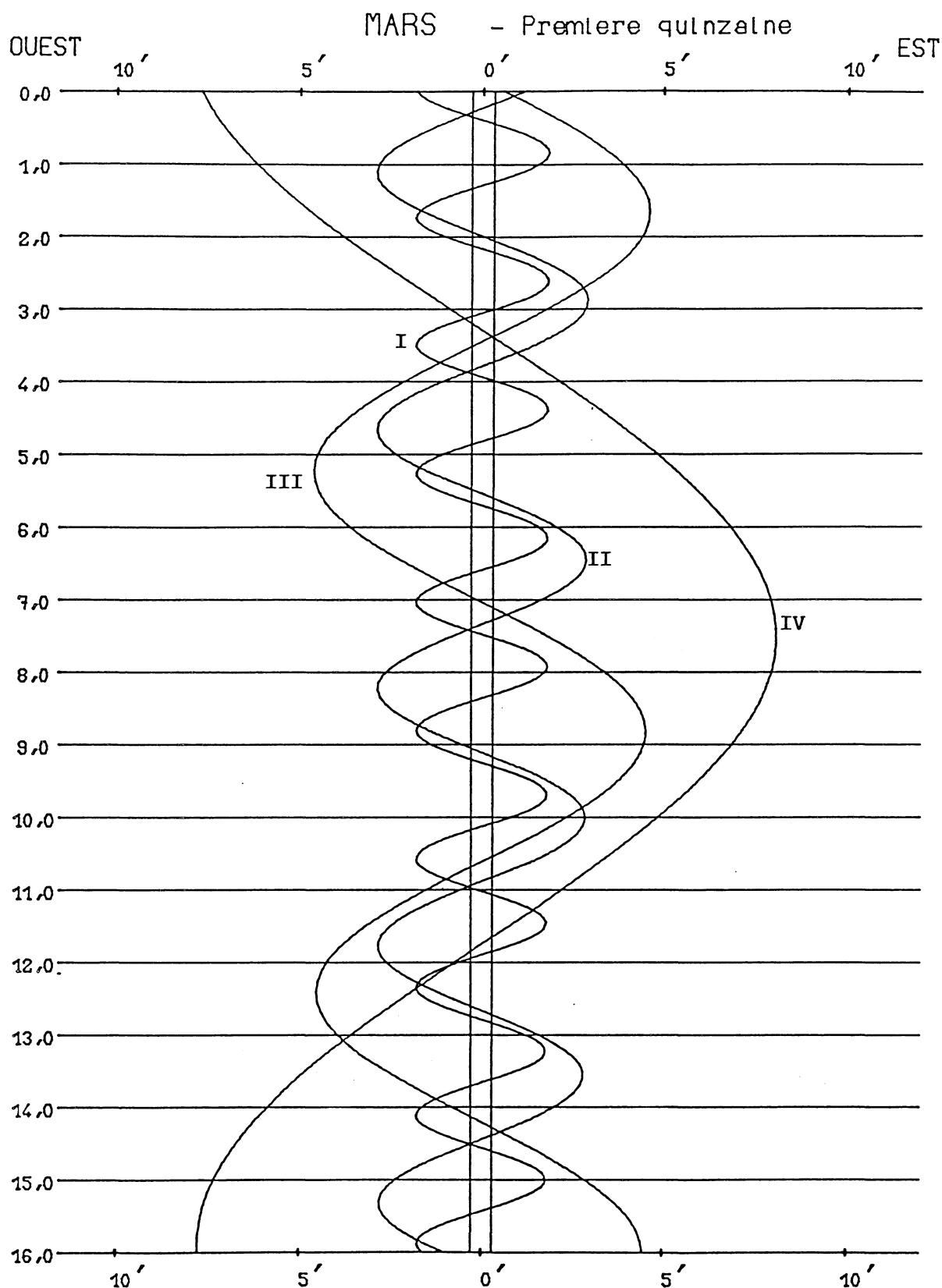
Dans le sens OUEST-EST, les satellites passent au-delà de Jupiter



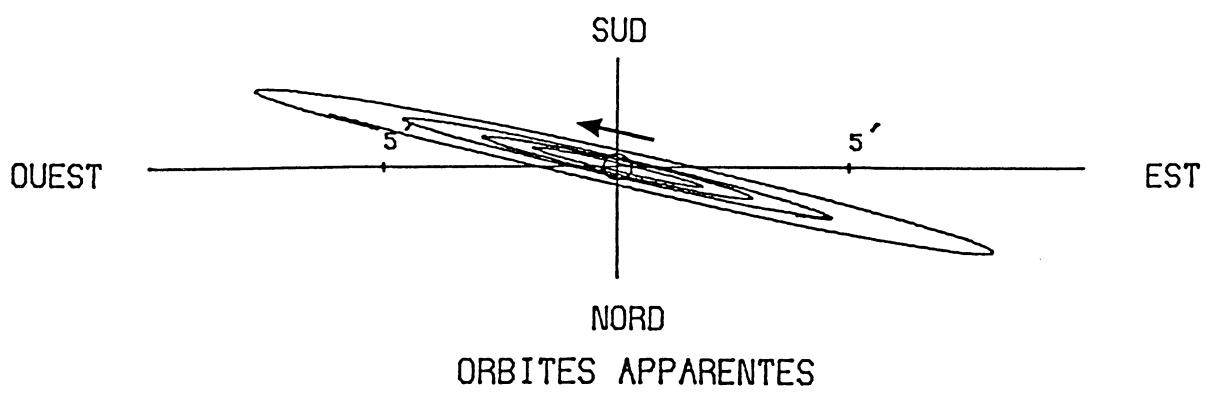
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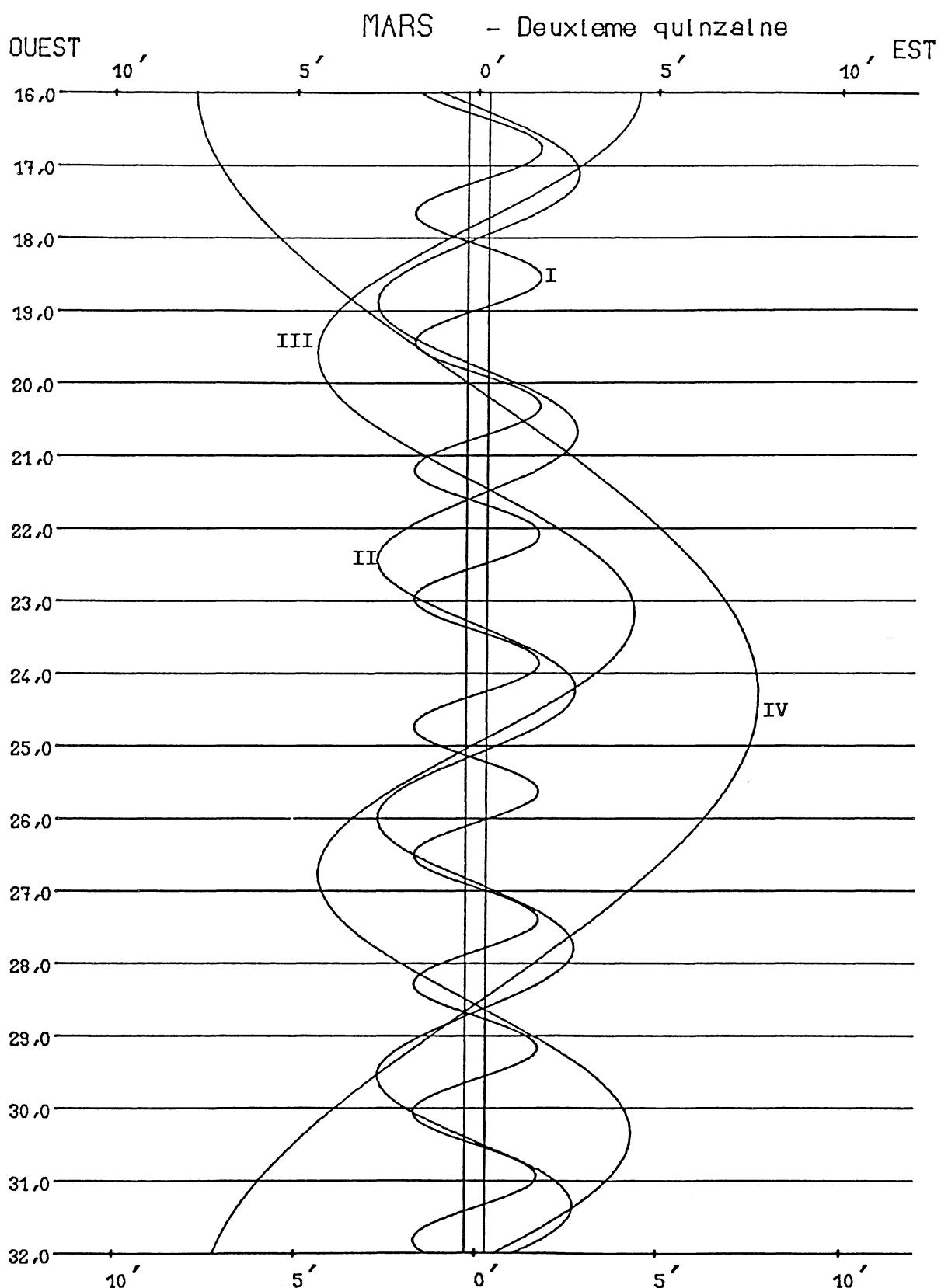
1989 - SATELLITES DE JUPITER -

| PHENOMENES | | | | | | MOIS : | | | MARS - PREMIERE QUINZAINE - | | | | | | | | |
|------------|----|----|-----|----------|----------|--------|----|----|-----------------------------|----------|----------|------|----|----|----------|----------|----------|
| JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE |
| 1 | 5 | 40 | 19 | I | PA.D.EXT | 19 | 28 | 12 | I | EC.F.PEN | 22 | 33 | 33 | II | PA.F.INT | | |
| | 5 | 44 | 7 | I | PA.D.INT | | | | | | 22 | 38 | 11 | II | PA.F.EXT | | |
| 6 | 57 | 47 | I | OM.D.EXT | 6 | 13 | 8 | 42 | I | PA.D.EXT | 22 | 39 | 0 | II | OM.D.EXT | | |
| 7 | 1 | 36 | I | OM.D.INT | | 13 | 12 | 30 | I | PA.D.INT | 22 | 43 | 37 | II | OM.D.INT | | |
| 7 | 50 | 33 | I | PA.F.INT | | 14 | 24 | 42 | I | OM.D.EXT | 23 | 24 | 58 | I | OC.D.EXT | | |
| 7 | 54 | 22 | I | PA.F.EXT | | 14 | 28 | 32 | I | OM.D.INT | 23 | 28 | 45 | I | OC.D.INT | | |
| 9 | 8 | 37 | I | OM.F.INT | | 15 | 19 | 5 | I | PA.F.INT | | | | | | | |
| 9 | 12 | 26 | I | OM.F.EXT | | 15 | 22 | 54 | I | PA.F.EXT | 11 | 1 | 1 | 40 | II | OM.F.INT | |
| 22 | 31 | 32 | II | OC.D.EXT | | 16 | 35 | 39 | I | OM.F.INT | | 1 | 6 | 16 | II | OM.F.EXT | |
| 22 | 36 | 18 | II | OC.D.INT | | 16 | 39 | 28 | I | OM.F.EXT | | 2 | 50 | 3 | I | EC.F.INT | |
| | | | | | | 23 | 20 | 47 | III | OC.D.EXT | | 2 | 53 | 51 | I | EC.F.EXT | |
| 2 | 0 | 55 | 5 | II | OC.F.INT | | 23 | 33 | 29 | III | OC.D.INT | | 2 | 54 | 38 | I | EC.F.PEN |
| | 0 | 59 | 51 | II | OC.F.EXT | | | | | | | 20 | 37 | 26 | I | PA.D.EXT | |
| 1 | 10 | 35 | II | EC.D.PEN | 7 | 1 | 47 | 32 | III | OC.F.INT | | 20 | 41 | 15 | I | PA.D.INT | |
| 1 | 12 | 29 | II | EC.D.EXT | | 2 | 0 | 15 | III | OC.F.EXT | | 21 | 51 | 31 | I | OM.D.EXT | |
| 1 | 17 | 17 | II | EC.D.INT | | 4 | 32 | 32 | III | EC.D.PEN | | 21 | 55 | 21 | I | OM.D.INT | |
| 2 | 27 | 58 | I | OC.D.EXT | | 4 | 37 | 12 | III | EC.D.EXT | | 22 | 47 | 58 | I | PA.F.INT | |
| 3 | 1 | 45 | I | OC.D.INT | | 4 | 50 | 45 | III | EC.D.INT | | 22 | 51 | 47 | I | PA.F.EXT | |
| 3 | 33 | 52 | II | EC.F.INT | | 6 | 51 | 46 | II | PA.D.EXT | | | | | | | |
| 3 | 38 | 40 | II | EC.F.EXT | | 6 | 52 | 57 | III | EC.F.INT | 12 | 0 | 2 | 35 | I | OM.F.INT | |
| 3 | 40 | 34 | II | EC.F.PEN | | 6 | 56 | 23 | II | PA.D.INT | | 0 | 6 | 24 | I | OM.F.EXT | |
| 6 | 25 | 57 | I | EC.F.EXT | | 7 | 6 | 31 | III | EC.F.EXT | | 14 | 37 | 4 | II | OC.D.EXT | |
| 6 | 29 | 45 | I | EC.F.EXT | | 7 | 11 | 10 | III | EC.F.PEN | | 14 | 41 | 49 | II | OC.D.INT | |
| 6 | 30 | 32 | I | EC.F.PEN | | 9 | 12 | 50 | II | PA.F.INT | | 17 | 1 | 25 | II | OC.F.INT | |
| | | | | | | 9 | 17 | 29 | II | PA.F.EXT | | 17 | 6 | 10 | II | OC.F.EXT | |
| 3 | 0 | 9 | 45 | I | PA.D.EXT | | 9 | 21 | 10 | II | OM.D.EXT | | 17 | 8 | 54 | II | EC.D.PEN |
| 0 | 13 | 34 | I | PA.D.INT | | 9 | 25 | 48 | II | OM.D.INT | | 17 | 10 | 48 | II | EC.D.EXT | |
| 1 | 26 | 47 | I | OM.D.EXT | | 10 | 26 | 1 | I | OC.D.EXT | | 17 | 15 | 35 | II | EC.D.INT | |
| 1 | 30 | 37 | I | OM.D.INT | | 10 | 29 | 49 | I | OC.D.INT | | 17 | 54 | 30 | I | OC.D.EXT | |
| 2 | 20 | 2 | I | PA.F.INT | | 11 | 43 | 40 | II | OM.F.INT | | 17 | 58 | 17 | I | OC.D.INT | |
| 2 | 23 | 51 | I | PA.F.EXT | | 11 | 48 | 16 | II | OM.F.EXT | | 19 | 32 | 45 | II | EC.F.INT | |
| 3 | 37 | 40 | I | OM.F.INT | | 13 | 52 | 25 | I | EC.F.INT | | 19 | 37 | 33 | II | EC.F.EXT | |
| 3 | 41 | 29 | I | OM.F.EXT | | 13 | 56 | 13 | I | EC.F.EXT | | 19 | 39 | 26 | II | EC.F.PEN | |
| 9 | 17 | 34 | III | PA.D.EXT | | 13 | 57 | 0 | I | EC.F.PEN | | 21 | 18 | 52 | I | EC.F.INT | |
| 9 | 30 | 11 | III | PA.D.INT | | | | | | | | 21 | 22 | 39 | I | EC.F.EXT | |
| 11 | 41 | 25 | III | PA.F.INT | 8 | 7 | 38 | 12 | I | PA.D.EXT | | 21 | 23 | 26 | I | EC.F.PEN | |
| 11 | 54 | 10 | III | PA.F.EXT | | 7 | 42 | 1 | I | PA.D.INT | | | | | | | |
| 14 | 31 | 16 | III | OM.D.EXT | | 8 | 53 | 37 | I | OM.D.EXT | 13 | 15 | 7 | 11 | I | PA.D.EXT | |
| 14 | 44 | 15 | III | OM.D.INT | | 8 | 57 | 27 | I | OM.D.INT | | 15 | 11 | 0 | I | PA.D.INT | |
| 16 | 54 | 35 | III | OM.F.INT | | 9 | 48 | 38 | I | PA.F.INT | | 16 | 20 | 32 | I | OM.D.EXT | |
| 17 | 7 | 26 | III | OM.F.EXT | | 9 | 52 | 28 | I | PA.F.EXT | | 16 | 24 | 21 | I | OM.D.INT | |
| 17 | 31 | 42 | II | PA.D.EXT | | 11 | 4 | 37 | I | OM.F.INT | | 17 | 17 | 47 | I | PA.F.INT | |
| 17 | 36 | 20 | II | PA.D.INT | | 11 | 8 | 26 | I | OM.F.EXT | | 17 | 21 | 36 | I | PA.F.EXT | |
| 19 | 52 | 31 | II | PA.F.INT | 9 | 1 | 14 | 28 | II | OC.D.EXT | | 18 | 31 | 38 | I | OM.F.INT | |
| 19 | 57 | 10 | II | PA.F.EXT | 9 | | | | | | | 18 | 35 | 27 | I | OM.F.EXT | |
| 20 | 3 | 19 | II | OM.D.EXT | | 1 | 19 | 14 | II | OC.D.INT | | | | | | | |
| 20 | 7 | 58 | II | OM.D.INT | | 3 | 38 | 34 | II | OC.F.INT | 14 | 3 | 33 | 51 | III | OC.D.EXT | |
| 21 | 27 | 17 | I | OC.D.EXT | | 3 | 43 | 19 | II | OC.F.EXT | | 3 | 46 | 27 | III | OC.D.INT | |
| 21 | 31 | 5 | I | OC.D.INT | | 3 | 49 | 9 | II | EC.D.PEN | | 6 | 1 | 43 | III | OC.F.INT | |
| 22 | 25 | 37 | II | OM.F.INT | | 3 | 51 | 2 | II | EC.D.EXT | | 6 | 14 | 19 | III | OC.F.EXT | |
| 22 | 30 | 14 | II | OM.F.EXT | | 3 | 55 | 50 | II | EC.D.INT | | 8 | 34 | 0 | III | EC.D.PEN | |
| | | | | | | 4 | 55 | 27 | I | OC.D.EXT | | 8 | 38 | 37 | III | EC.D.EXT | |
| 4 | 0 | 54 | 48 | I | EC.F.INT | | 4 | 59 | 14 | I | OC.D.INT | | 8 | 52 | 5 | III | EC.D.INT |
| | 0 | 58 | 36 | I | EC.F.EXT | | 6 | 12 | 48 | II | EC.F.INT | | 9 | 33 | 1 | II | PA.D.EXT |
| 0 | 59 | 23 | I | EC.F.PEN | | 6 | 17 | 36 | II | EC.F.EXT | | 9 | 37 | 38 | II | PA.D.INT | |
| 18 | 39 | 8 | I | PA.D.EXT | | 6 | 19 | 29 | II | EC.F.PEN | | 10 | 55 | 15 | III | EC.F.INT | |
| 18 | 42 | 57 | I | PA.D.INT | | 8 | 21 | 13 | I | EC.F.INT | | 11 | 8 | 43 | III | EC.F.EXT | |
| 19 | 55 | 41 | I | OM.D.INT | | 8 | 25 | 1 | I | EC.F.EXT | | 11 | 13 | 21 | III | EC.F.PEN | |
| 19 | 59 | 31 | I | OM.D.INT | | 8 | 25 | 48 | I | EC.F.PEN | | 11 | 54 | 36 | II | PA.F.INT | |
| 20 | 49 | 28 | I | PA.F.INT | | | | | | | | 11 | 56 | 47 | II | OM.D.EXT | |
| 20 | 53 | 17 | I | PA.F.EXT | 10 | 2 | 7 | 51 | I | PA.D.EXT | | 11 | 59 | 14 | II | PA.F.EXT | |
| 22 | 6 | 36 | I | OM.F.INT | | 2 | 11 | 40 | I | PA.D.INT | | 12 | 1 | 24 | II | OM.D.INT | |
| 22 | 10 | 25 | I | OM.F.EXT | | 3 | 22 | 38 | I | OM.D.EXT | | 12 | 24 | 5 | I | OC.D.EXT | |
| | | | | | | 3 | 26 | 27 | I | OM.D.INT | | 12 | 27 | 52 | I | OC.D.INT | |
| 5 | 11 | 53 | 11 | II | OC.D.EXT | | 4 | 18 | 20 | I | PA.F.INT | | 14 | 19 | 40 | II | OM.F.INT |
| 11 | 57 | 57 | II | OC.D.INT | | 4 | 22 | 10 | I | PA.F.EXT | | 14 | 24 | 16 | II | OM.F.EXT | |
| 14 | 17 | 1 | II | OC.F.INT | | 5 | 33 | 40 | I | OM.F.INT | | 15 | 47 | 40 | I | EC.F.INT | |
| 14 | 21 | 47 | II | OC.F.EXT | | 5 | 37 | 29 | I | OM.F.EXT | | 15 | 51 | 27 | I | EC.F.EXT | |
| 14 | 30 | 18 | II | EC.D.PEN | | 13 | 28 | 7 | III | PA.D.EXT | | 15 | 52 | 14 | I | EC.F.PEN | |
| 14 | 32 | 11 | II | EC.D.EXT | | 13 | 40 | 39 | III | PA.D.INT | | | | | | | |
| 14 | 37 | 0 | II | EC.D.INT | | 15 | 53 | 15 | III | PA.F.INT | 15 | 9 | 36 | 53 | I | PA.D.EXT | |
| 15 | 56 | 38 | I | OC.D.EXT | | 16 | 5 | 54 | III | PA.F.EXT | | 9 | 40 | 42 | I | PA.D.INT | |
| 16 | 0 | 25 | I | OC.D.INT | | 18 | 32 | 16 | III | OM.D.EXT | | 10 | 49 | 27 | I | OM.D.EXT | |
| 16 | 53 | 46 | II | EC.F.INT | | 18 | 45 | 11 | III | OM.D.INT | | 10 | 53 | 16 | I | OM.D.INT | |
| 16 | 58 | 35 | II | EC.F.EXT | | 20 | 12 | 14 | II | PA.D.EXT | | 11 | 47 | 32 | I | PA.F.INT | |
| 17 | 0 | 28 | II | EC.F.PEN | | 20 | 16 | 51 | II | PA.D.INT | | 11 | 51 | 21 | I | PA.F.EXT | |
| 19 | 23 | 37 | I | EC.F.INT | | 20 | 56 | 27 | III | OM.F.INT | | 13 | 0 | 36 | I | OM.F.INT | |
| 19 | 27 | 25 | I | EC.F.EXT | | 21 | 9 | 13 | III | OM.F.EXT | | 13 | 4 | 25 | I | OM.F.EXT | |

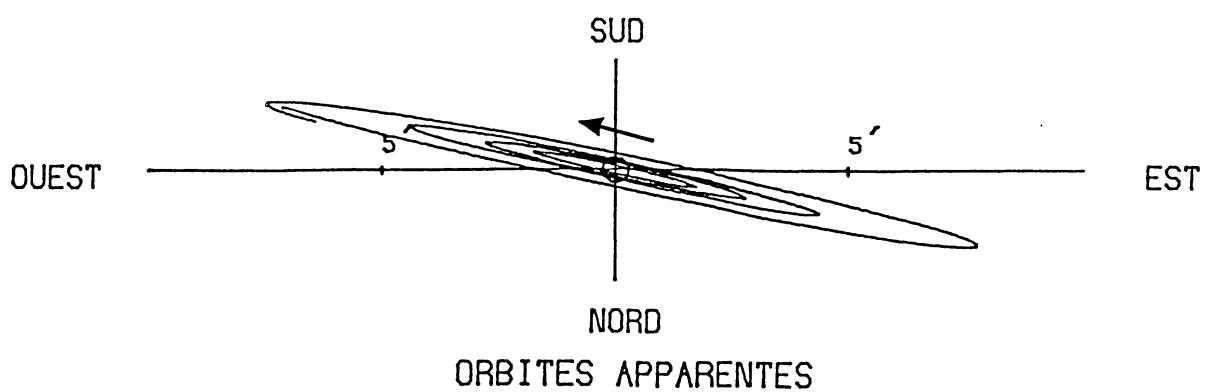


Dans le sens OUEST-EST, les satellites passent au-delà de Jupiter



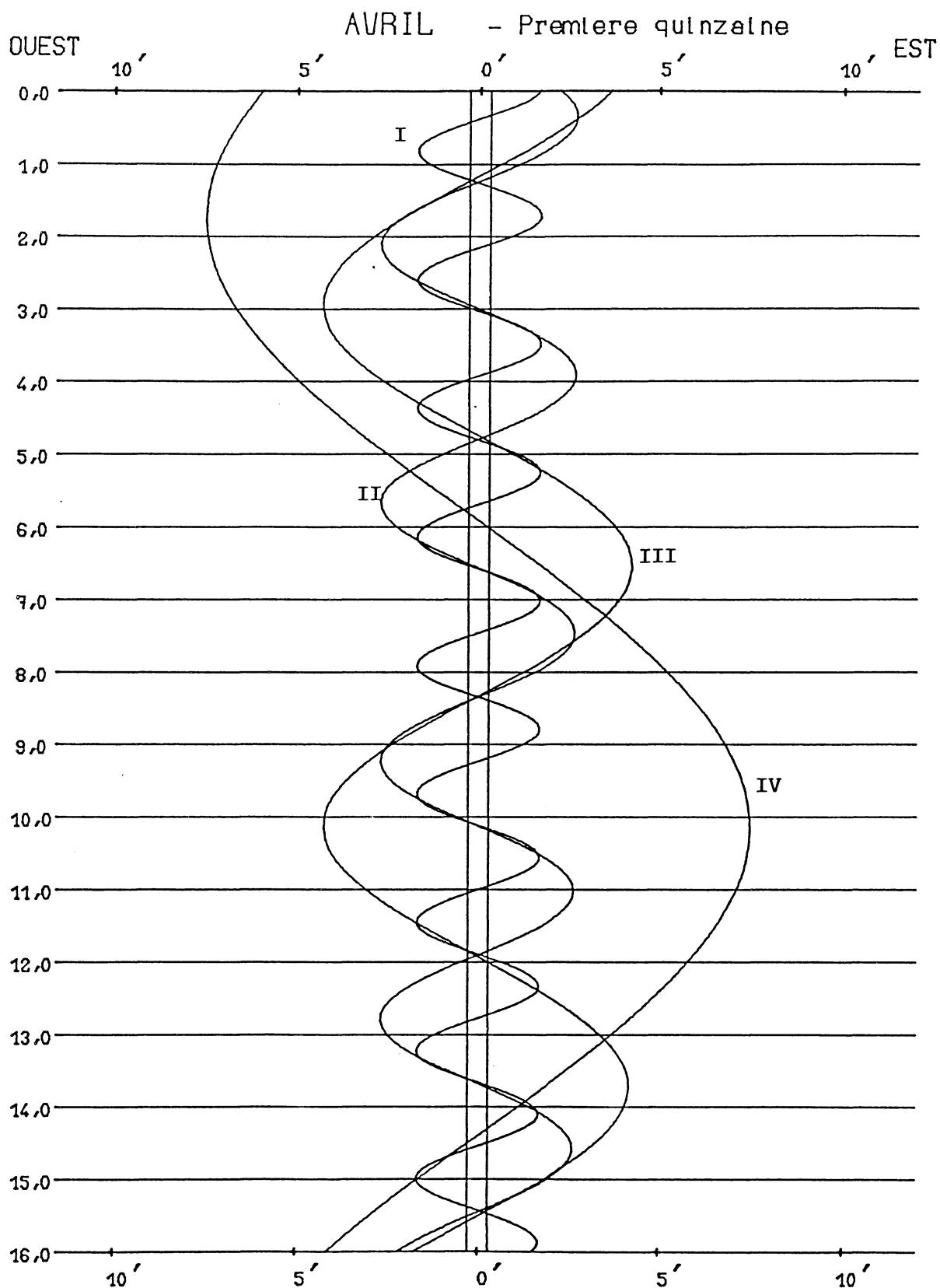


Dans le sens OUEST-EST, les satellites passent au-delà de Jupiter

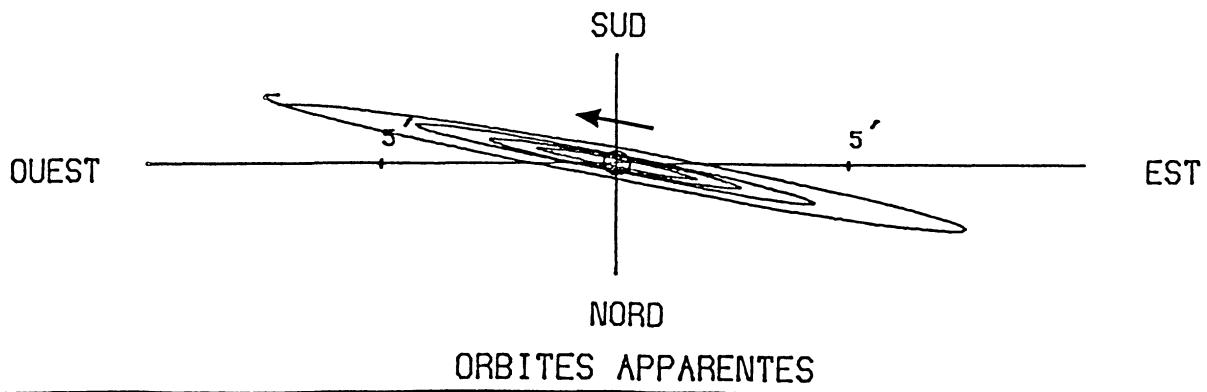


1989 - SATELLITES DE JUPITER -

| PHENOMENES | | | | | MOIS : | | | AVRIL - PREMIERE QUINZAINE - | | | | | | | | | |
|------------|----|----|----|-----|----------|----------|----|------------------------------|-----|----------|----------|------|----|----|-----|----------|----------|
| JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE |
| 1 | 2 | 19 | 31 | III | PA.D.EXT | 16 | 36 | 40 | I | OM.D.EXT | | 2 | 19 | 5 | I | OM.F.EXT | |
| | 2 | 31 | 52 | III | PA.D.INT | 16 | 40 | 29 | I | OM.D.INT | | 20 | 22 | 13 | I | OC.D.EXT | |
| | 4 | 21 | 43 | II | PA.D.EXT | 17 | 48 | 2 | I | PA.F.INT | | 20 | 25 | 59 | I | OC.D.INT | |
| | 4 | 26 | 18 | II | PA.D.INT | 17 | 51 | 51 | I | PA.F.EXT | | 20 | 30 | 2 | II | PA.D.EXT | |
| | 4 | 47 | 53 | III | PA.F.INT | 18 | 48 | 22 | I | OM.F.INT | | 20 | 34 | 36 | II | PA.D.INT | |
| | 5 | 0 | 19 | III | PA.F.EXT | 18 | 52 | 11 | I | OM.F.EXT | | 20 | 49 | 55 | III | OC.D.EXT | |
| | 5 | 21 | 58 | I | OC.D.EXT | | | | | | | 21 | 2 | 14 | III | OC.D.INT | |
| | 5 | 25 | 45 | I | OC.D.INT | 6 | 12 | 21 | 37 | II | OC.D.EXT | | 22 | 18 | 32 | II | OM.D.EXT |
| | 6 | 25 | 30 | II | OM.D.EXT | 12 | 26 | 20 | II | OC.D.INT | | 22 | 23 | 6 | II | OM.D.INT | |
| | 6 | 30 | 5 | II | OM.D.INT | 12 | 51 | 58 | I | OC.D.EXT | | 22 | 53 | 46 | II | PA.F.INT | |
| | 6 | 36 | 28 | III | OM.D.EXT | 12 | 55 | 44 | I | OC.D.INT | | 22 | 58 | 20 | II | PA.F.EXT | |
| | 6 | 44 | 37 | II | PA.F.INT | 16 | 1 | 49 | I | EC.F.INT | | 23 | 21 | 15 | III | OC.F.INT | |
| | 6 | 49 | 10 | III | OM.D.INT | 16 | 5 | 36 | I | EC.F.EXT | | 23 | 28 | 5 | I | EC.F.INT | |
| | 6 | 49 | 12 | II | PA.F.EXT | 16 | 6 | 23 | I | EC.F.PEN | | 23 | 31 | 52 | I | EC.F.EXT | |
| | 8 | 35 | 31 | I | EC.F.INT | 16 | 48 | 32 | II | EC.F.INT | | 23 | 32 | 39 | I | EC.F.PEN | |
| | 8 | 39 | 19 | I | EC.F.EXT | 16 | 53 | 17 | II | EC.F.EXT | | 23 | 33 | 34 | III | OC.F.EXT | |
| | 8 | 40 | 6 | I | EC.F.PEN | 16 | 55 | 9 | II | EC.F.PEN | | | | | | | |
| | 8 | 49 | 30 | II | OM.F.INT | | | | | | 12 | 0 | 36 | 1 | III | EC.D.PEN | |
| | 8 | 54 | 4 | II | OM.F.EXT | 7 | 10 | 7 | 0 | I | PA.D.EXT | | 0 | 40 | 32 | III | EC.D.EXT |
| | 9 | 3 | 26 | III | OM.F.INT | 10 | 10 | 49 | I | PA.D.INT | | 0 | 43 | 16 | II | OM.F.INT | |
| | 9 | 16 | 1 | III | OM.F.EXT | 11 | 5 | 38 | I | OM.D.EXT | | 0 | 47 | 49 | II | OM.F.EXT | |
| 2 | 2 | 36 | 25 | I | PA.D.EXT | 12 | 18 | 21 | I | PA.F.INT | | 3 | 0 | 46 | III | EC.F.INT | |
| | 2 | 40 | 14 | I | PA.D.INT | 12 | 22 | 9 | I | PA.F.EXT | | 3 | 13 | 53 | III | EC.F.EXT | |
| | 3 | 38 | 49 | I | OM.D.EXT | 13 | 17 | 23 | I | OM.F.INT | | 3 | 18 | 24 | III | EC.F.PEN | |
| | 3 | 42 | 38 | I | OM.D.INT | 13 | 21 | 12 | I | OM.F.EXT | | 17 | 37 | 43 | I | PA.D.EXT | |
| | 4 | 47 | 36 | I | PA.F.INT | | | | | | | 17 | 41 | 31 | I | PA.D.INT | |
| | 4 | 51 | 25 | I | PA.F.EXT | 8 | 6 | 42 | 4 | III | PA.D.EXT | | 18 | 32 | 17 | I | OM.D.EXT |
| | 5 | 50 | 25 | I | OM.F.INT | 6 | 54 | 21 | III | PA.D.INT | | 18 | 36 | 6 | I | OM.D.INT | |
| | 5 | 54 | 14 | I | OM.F.EXT | 7 | 7 | 4 | II | PA.D.EXT | | 19 | 49 | 12 | I | PA.F.INT | |
| | 22 | 57 | 36 | II | OC.D.EXT | 7 | 11 | 38 | II | PA.D.INT | | 19 | 53 | 1 | I | PA.F.EXT | |
| | 23 | 2 | 19 | II | OC.D.INT | 7 | 22 | 2 | I | OC.D.EXT | | 20 | 44 | 11 | I | OM.F.INT | |
| | 23 | 51 | 57 | I | OC.D.EXT | 7 | 25 | 48 | I | OC.D.INT | | 20 | 47 | 59 | I | OM.F.EXT | |
| | 23 | 55 | 44 | I | OC.D.INT | 9 | 0 | 53 | II | OM.D.EXT | | | | | | | |
| 3 | 3 | 3 | 4 | 18 | I | EC.F.INT | 9 | 11 | 25 | III | PA.F.INT | 13 | 14 | 52 | 20 | I | OC.D.EXT |
| | 3 | 8 | 6 | I | EC.F.EXT | 9 | 23 | 46 | III | PA.F.EXT | | 14 | 56 | 6 | I | OC.D.INT | |
| | 3 | 8 | 53 | I | EC.F.PEN | 9 | 30 | 30 | II | PA.F.INT | | 15 | 11 | 17 | II | OC.D.EXT | |
| | 3 | 29 | 34 | II | EC.F.INT | 9 | 35 | 4 | II | PA.F.EXT | | 15 | 15 | 59 | II | OC.D.INT | |
| | 3 | 34 | 20 | II | EC.F.EXT | 10 | 30 | 34 | I | EC.F.INT | | 17 | 56 | 49 | I | EC.F.INT | |
| | 3 | 36 | 12 | II | EC.F.PEN | 10 | 34 | 22 | I | EC.F.EXT | | 18 | 0 | 36 | I | EC.F.EXT | |
| | 21 | 6 | 37 | I | PA.D.EXT | 10 | 35 | 8 | I | EC.F.PEN | | 19 | 27 | 19 | II | EC.F.INT | |
| | 21 | 10 | 26 | I | PA.D.INT | 10 | 38 | 7 | III | OM.D.EXT | | 19 | 32 | 2 | II | EC.F.EXT | |
| | 22 | 7 | 47 | I | OM.D.EXT | 10 | 50 | 43 | III | OM.D.INT | | 19 | 33 | 54 | II | EC.F.PEN | |
| | 22 | 11 | 36 | I | OM.D.INT | 11 | 25 | 22 | II | OM.F.INT | | | | | | | |
| | 23 | 17 | 51 | I | PA.F.EXT | 11 | 29 | 55 | II | OM.F.EXT | 14 | 12 | 8 | 4 | I | PA.D.EXT | |
| | 23 | 21 | 40 | I | PA.F.EXT | 13 | 6 | 2 | III | OM.F.INT | | 12 | 11 | 52 | I | PA.D.INT | |
| | | | | | | 13 | 18 | 34 | III | OM.F.EXT | | 13 | 1 | 14 | I | OM.D.EXT | |
| 4 | 0 | 19 | 26 | I | OM.F.INT | | | | | | | 13 | 5 | 3 | I | OM.D.INT | |
| | 0 | 23 | 15 | I | OM.F.EXT | 9 | 4 | 37 | 10 | I | PA.D.EXT | | 14 | 19 | 36 | I | PA.F.INT |
| | 16 | 27 | 23 | III | OC.D.EXT | 4 | 40 | 58 | I | PA.D.INT | | 14 | 23 | 25 | I | PA.F.EXT | |
| | 16 | 39 | 45 | III | OC.D.INT | 5 | 34 | 28 | I | OM.D.EXT | | 15 | 13 | 10 | I | OM.F.INT | |
| | 17 | 44 | 15 | II | PA.D.EXT | 5 | 38 | 17 | I | OM.D.INT | | 15 | 16 | 59 | I | OM.F.EXT | |
| | 17 | 48 | 49 | II | PA.D.INT | 6 | 48 | 33 | I | PA.F.INT | | | | | | | |
| | 18 | 21 | 57 | I | OC.D.EXT | 6 | 52 | 22 | I | PA.F.EXT | 15 | 9 | 22 | 29 | I | OC.D.EXT | |
| | 18 | 25 | 43 | I | OC.D.INT | 7 | 46 | 16 | I | OM.F.INT | | 9 | 26 | 16 | I | OC.D.INT | |
| | 18 | 57 | 56 | III | OC.F.INT | 7 | 50 | 5 | I | OM.F.EXT | | 9 | 53 | 14 | II | PA.D.EXT | |
| | 19 | 10 | 19 | III | OC.F.EXT | | | | | | | 9 | 57 | 47 | II | PA.D.INT | |
| | 19 | 43 | 11 | II | OM.D.EXT | 10 | 1 | 46 | 48 | II | OC.D.EXT | | 11 | 5 | 40 | III | PA.D.EXT |
| | 19 | 47 | 46 | II | OM.D.INT | 1 | 51 | 30 | II | OC.D.INT | | 11 | 17 | 54 | III | PA.D.INT | |
| | 20 | 7 | 25 | II | PA.F.INT | 1 | 52 | 7 | I | OC.D.EXT | | 11 | 36 | 10 | II | OM.D.EXT | |
| | 20 | 12 | 0 | II | PA.F.EXT | 1 | 55 | 53 | I | OC.D.INT | | 11 | 40 | 44 | II | OM.D.INT | |
| | 20 | 35 | 31 | III | EC.D.PEN | 4 | 59 | 20 | I | EC.F.INT | | 12 | 17 | 14 | II | PA.F.INT | |
| | 20 | 40 | 3 | III | EC.D.EXT | 5 | 3 | 8 | I | EC.F.EXT | | 12 | 21 | 48 | II | PA.F.EXT | |
| | 20 | 53 | 15 | III | EC.D.INT | 5 | 3 | 54 | I | EC.F.PEN | | 12 | 25 | 34 | I | EC.F.INT | |
| | 21 | 33 | 3 | I | EC.F.INT | 6 | 8 | 23 | II | EC.F.INT | | 12 | 29 | 21 | I | EC.F.EXT | |
| | 21 | 36 | 51 | I | EC.F.EXT | 6 | 13 | 7 | II | EC.F.EXT | | 12 | 30 | 8 | I | EC.F.PEN | |
| | 21 | 37 | 38 | I | EC.F.PEN | 6 | 14 | 59 | II | EC.F.PEN | | 13 | 35 | 56 | III | PA.F.INT | |
| | 22 | 7 | 26 | II | OM.F.INT | 23 | 7 | 28 | I | PA.D.EXT | | 13 | 48 | 13 | III | PA.F.EXT | |
| | 22 | 11 | 59 | II | OM.F.EXT | 23 | 11 | 17 | I | PA.D.INT | | 14 | 1 | 9 | II | OM.F.INT | |
| | 22 | 59 | 22 | III | EC.F.INT | | | | | | | 14 | 5 | 42 | II | OM.F.EXT | |
| | 23 | 12 | 34 | III | EC.F.EXT | 11 | 0 | 3 | 26 | I | OM.D.EXT | | 14 | 38 | 50 | III | OM.D.EXT |
| | 23 | 17 | 7 | III | EC.F.PEN | 0 | 7 | 14 | I | OM.D.INT | | 14 | 51 | 22 | III | OM.D.INT | |
| | | | | | | 1 | 18 | 55 | I | PA.F.INT | | 17 | 7 | 44 | III | OM.F.INT | |
| 5 | 15 | 36 | 45 | I | PA.D.EXT | 1 | 22 | 43 | I | PA.F.EXT | | 17 | 20 | 12 | III | OM.F.EXT | |
| | 15 | 40 | 34 | I | PA.D.INT | 2 | 15 | 16 | I | OM.F.INT | | | | | | | |



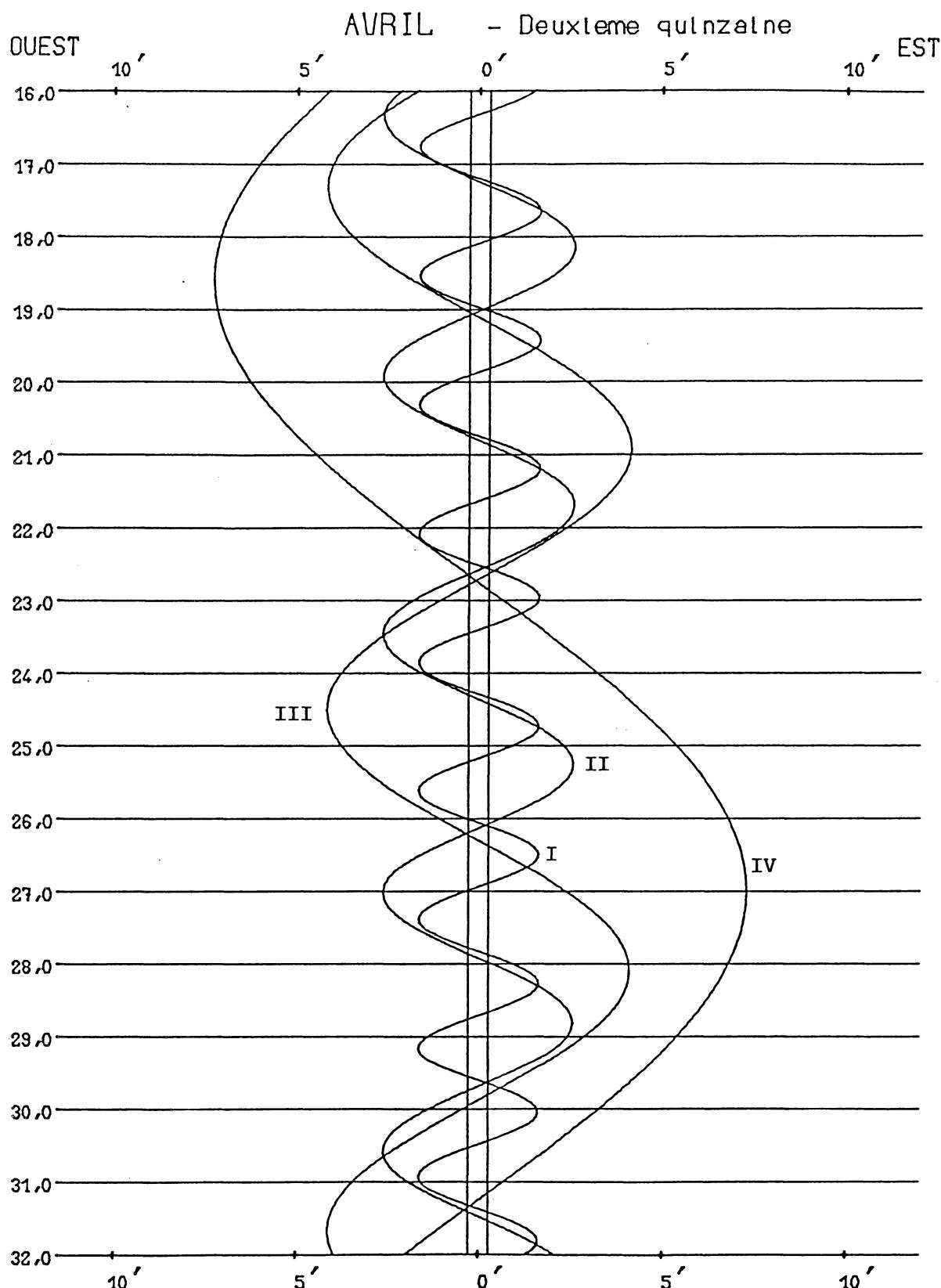
Dans le sens OUEST-EST ,les satellites passent au-delà de Jupiter



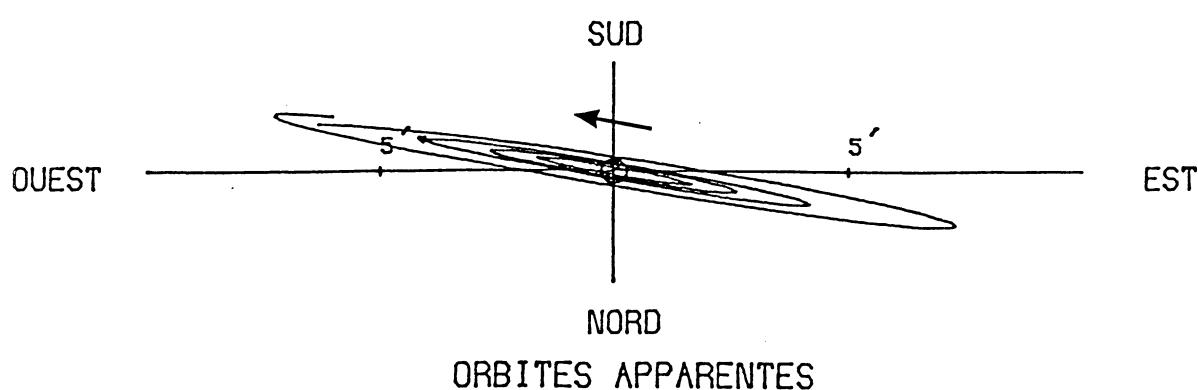
30.

1989 - SATELLITES DE JUPITER -

| PHENOMENES | | | | | | MOIS : | | | AVRIL - DEUXIEME QUINZAINE - | | | | | | | | |
|------------|----|----|----|-----|----------|--------|----|----|------------------------------|-----|----------|------|----|----|----|-----|----------|
| JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE |
| 16 | 6 | 38 | 19 | I | PA.D.EXT | 21 | 14 | 9 | 29 | I | PA.D.EXT | 27 | 5 | 53 | 22 | III | OC.D.INT |
| | 6 | 42 | 7 | I | PA.D.INT | | 14 | 13 | 17 | I | PA.D.INT | | 5 | 54 | 48 | II | OM.F.INT |
| | 7 | 30 | 3 | I | OM.D.EXT | | 14 | 56 | 46 | I | OM.D.EXT | | 5 | 59 | 21 | II | OM.F.INT |
| | 7 | 33 | 52 | I | OM.D.INT | | 15 | 0 | 35 | I | OM.D.INT | | 8 | 14 | 0 | III | OC.F.INT |
| | 8 | 49 | 54 | I | PA.F.INT | | 16 | 21 | 12 | I | PA.F.INT | | 8 | 26 | 12 | III | OC.F.INT |
| | 8 | 53 | 43 | I | PA.F.EXT | | 16 | 25 | 1 | I | PA.F.EXT | | 8 | 37 | 56 | III | EC.D.PEN |
| | 9 | 42 | 2 | I | OM.F.INT | | 17 | 8 | 53 | I | OM.F.INT | | 8 | 42 | 24 | III | EC.D.INT |
| | 9 | 45 | 51 | I | OM.F.EXT | | 17 | 12 | 41 | I | OM.F.EXT | | 8 | 55 | 19 | III | EC.D.INT |
| | | | | | | | | | | | | | 11 | 4 | 30 | III | EC.F.INT |
| 17 | 3 | 52 | 40 | I | OC.D.EXT | 22 | 11 | 23 | 16 | I | OC.D.EXT | 27 | 11 | 17 | 26 | III | EC.F.INT |
| | 3 | 56 | 26 | I | OC.D.INT | | 11 | 27 | 3 | I | OC.D.INT | | 11 | 21 | 55 | III | EC.F.PEN |
| | 4 | 36 | 54 | II | OC.D.EXT | | 12 | 40 | 10 | II | PA.D.EXT | | 21 | 40 | 40 | I | PA.D.EXT |
| | 4 | 41 | 35 | II | OC.D.INT | | 12 | 44 | 42 | II | PA.D.INT | | 21 | 44 | 28 | I | PA.D.INT |
| | 6 | 54 | 19 | I | EC.F.INT | | 14 | 11 | 24 | II | OM.D.EXT | | 22 | 23 | 18 | I | OM.D.INT |
| | 6 | 58 | 6 | I | EC.F.EXT | | 14 | 15 | 57 | II | OM.D.INT | | 22 | 27 | 7 | I | OM.D.INT |
| | 6 | 58 | 53 | I | EC.F.PEN | | 14 | 20 | 30 | I | EC.F.INT | | 23 | 52 | 32 | I | PA.F.INT |
| | 8 | 47 | 8 | II | EC.F.INT | | 14 | 24 | 17 | I | EC.F.EXT | | 23 | 56 | 20 | I | PA.F.EXT |
| | 8 | 51 | 51 | II | EC.F.EXT | | 14 | 25 | 3 | I | EC.F.PEN | | | | | | |
| 18 | 8 | 53 | 43 | II | EC.F.PEN | 23 | 15 | 4 | 44 | II | PA.F.INT | 28 | 0 | 35 | 33 | I | OM.F.INT |
| | | | | | | | 15 | 9 | 17 | II | PA.F.EXT | | 0 | 39 | 21 | I | OM.F.EXT |
| | 1 | 8 | 43 | I | PA.D.EXT | | 15 | 30 | 40 | III | PA.D.EXT | | 18 | 54 | 2 | I | OC.D.INT |
| | 1 | 12 | 31 | I | PA.D.INT | | 15 | 42 | 51 | III | PA.D.INT | | 18 | 57 | 49 | I | OC.D.INT |
| | 1 | 59 | 0 | I | OM.D.EXT | | 16 | 36 | 54 | II | OM.F.INT | | 20 | 52 | 48 | II | OC.D.INT |
| | 2 | 2 | 48 | I | OM.D.INT | | 16 | 41 | 26 | II | OM.F.EXT | | 20 | 57 | 28 | II | OC.D.INT |
| | 3 | 20 | 21 | I | PA.F.INT | | 18 | 1 | 50 | III | PA.F.INT | | 21 | 46 | 39 | I | EC.F.INT |
| | 3 | 24 | 9 | I | PA.F.EXT | | 18 | 14 | 3 | III | PA.F.EXT | | 21 | 50 | 26 | I | EC.F.EXT |
| | 4 | 11 | 1 | I | OM.F.INT | | 18 | 39 | 15 | III | OM.D.EXT | | 21 | 51 | 13 | I | EC.F.PEN |
| 19 | 4 | 14 | 50 | I | OM.F.EXT | 24 | 18 | 51 | 43 | III | OM.D.INT | 29 | 0 | 44 | 32 | II | EC.F.INT |
| | 22 | 22 | 51 | I | OC.D.EXT | | 21 | 9 | 9 | III | OM.F.INT | | 0 | 49 | 14 | II | EC.F.EXT |
| | 22 | 26 | 37 | I | OC.D.INT | | 21 | 21 | 33 | III | OM.F.EXT | | 0 | 51 | 4 | II | EC.F.PEN |
| | 23 | 16 | 36 | II | PA.D.EXT | | 8 | 39 | 48 | I | PA.D.EXT | | 16 | 11 | 10 | I | PA.D.EXT |
| | 23 | 21 | 9 | II | PA.D.INT | | 8 | 43 | 37 | I | PA.D.INT | | 16 | 14 | 58 | I | PA.D.INT |
| | 0 | 53 | 47 | II | OM.D.EXT | | 9 | 25 | 34 | I | OM.D.EXT | | 16 | 52 | 13 | I | OM.D.INT |
| | 0 | 58 | 21 | II | OM.D.INT | | 9 | 29 | 23 | I | OM.D.INT | | 16 | 56 | 2 | I | OM.D.INT |
| | 1 | 15 | 5 | III | OC.D.EXT | | 10 | 51 | 35 | I | PA.F.INT | | 18 | 23 | 5 | I | PA.F.INT |
| | 1 | 23 | 3 | I | EC.F.INT | | 10 | 55 | 23 | I | PA.F.EXT | | 18 | 26 | 53 | I | PA.F.EXT |
| 20 | 1 | 26 | 50 | I | EC.F.EXT | 25 | 11 | 37 | 44 | I | OM.F.INT | 30 | 19 | 4 | 30 | I | OM.F.INT |
| | 1 | 27 | 20 | III | OC.D.INT | | 11 | 41 | 32 | I | OM.F.EXT | | 19 | 8 | 18 | I | OM.F.EXT |
| | 1 | 27 | 36 | I | EC.F.PEN | | 12 | 5 | 53 | II | OC.D.EXT | | 13 | 24 | 20 | I | OC.D.INT |
| | 1 | 40 | 54 | II | PA.F.INT | | 12 | 57 | 18 | I | OC.D.INT | | 13 | 28 | 6 | I | OC.D.INT |
| | 1 | 45 | 27 | II | PA.F.EXT | | 13 | 27 | 40 | II | OC.D.EXT | | 15 | 27 | 44 | II | PA.D.INT |
| | 3 | 19 | 2 | II | OM.F.INT | | 13 | 32 | 20 | II | OC.D.INT | | 15 | 32 | 16 | II | PA.D.INT |
| | 3 | 23 | 35 | II | OM.F.EXT | | 14 | 49 | 14 | I | EC.F.INT | | 16 | 15 | 22 | I | EC.F.INT |
| | 3 | 47 | 9 | III | OC.F.INT | | 14 | 53 | 1 | I | EC.F.EXT | | 16 | 19 | 9 | I | EC.F.EXT |
| | 3 | 59 | 25 | III | OC.F.EXT | | 14 | 53 | 48 | I | EC.F.PEN | | 16 | 19 | 55 | I | EC.F.PEN |
| 21 | 4 | 37 | 19 | III | EC.D.PEN | 26 | 11 | 25 | 43 | II | EC.F.INT | 30 | 16 | 46 | 37 | II | OM.D.INT |
| | 4 | 41 | 49 | III | EC.D.EXT | | 11 | 30 | 26 | II | EC.F.EXT | | 16 | 51 | 10 | II | OM.D.INT |
| | 4 | 54 | 50 | III | EC.D.INT | | 11 | 32 | 17 | II | EC.F.PEN | | 17 | 52 | 54 | II | PA.F.INT |
| | 7 | 2 | 59 | III | EC.F.INT | | 12 | 10 | 38 | II | OM.F.INT | | 17 | 57 | 26 | II | PA.F.EXT |
| | 7 | 16 | 0 | III | EC.F.EXT | | 13 | 14 | 5 | I | PA.D.EXT | | 19 | 12 | 38 | II | OM.F.EXT |
| | 19 | 39 | 2 | I | PA.D.EXT | | 13 | 54 | 29 | I | PA.D.INT | | 19 | 17 | 10 | II | OM.F.EXT |
| | 19 | 42 | 51 | I | PA.D.INT | | 13 | 58 | 18 | I | PA.D.INT | | 19 | 57 | 4 | III | PA.D.EXT |
| | 20 | 27 | 50 | I | OM.D.EXT | | 14 | 22 | 6 | I | PA.F.INT | | 20 | 9 | 12 | III | PA.D.EXT |
| | 20 | 31 | 39 | I | OM.D.INT | | 14 | 25 | 54 | I | PA.F.EXT | | 22 | 29 | 7 | III | PA.F.EXT |
| 22 | 21 | 50 | 43 | I | PA.F.INT | 27 | 16 | 6 | 41 | I | OM.F.INT | 30 | 22 | 41 | 17 | III | PA.F.EXT |
| | 21 | 54 | 32 | I | PA.F.EXT | | 16 | 10 | 29 | I | OM.F.EXT | | 22 | 52 | 6 | III | OM.D.INT |
| | 22 | 39 | 54 | I | OM.F.INT | | 17 | 41 | 11 | III | OC.D.EXT | | | | | | |
| | 22 | 43 | 43 | I | OM.F.EXT | | 18 | 23 | 46 | I | OC.D.EXT | | 1 | 10 | 36 | III | OM.F.INT |
| | | | | | | | 18 | 27 | 33 | I | OC.D.INT | | 1 | 22 | 56 | III | OM.F.EXT |
| | | | | | | | 19 | 8 | 26 | II | PA.D.EXT | | 10 | 41 | 34 | I | PA.D.EXT |
| | | | | | | | 19 | 17 | 57 | I | PA.D.INT | | 10 | 45 | 22 | I | PA.D.INT |
| | | | | | | | 19 | 31 | 57 | I | EC.F.INT | | 11 | 21 | 0 | I | OM.D.EXT |
| | | | | | | | 19 | 51 | 46 | I | EC.F.EXT | | 11 | 24 | 48 | I | OM.D.INT |
| 23 | 19 | 55 | 33 | I | EC.F.EXT | 28 | 19 | 22 | 30 | I | EC.F.PEN | 30 | 12 | 53 | 31 | I | PA.F.INT |
| | 19 | 56 | 20 | I | EC.F.PEN | | 19 | 29 | 3 | II | OM.D.EXT | | 12 | 57 | 19 | I | PA.F.EXT |
| | 22 | 6 | 0 | II | EC.F.INT | | 20 | 33 | 36 | II | OM.D.INT | | 13 | 33 | 19 | I | OM.F.INT |
| | 22 | 10 | 43 | II | EC.F.EXT | | 20 | 48 | 46 | II | PA.F.INT | | 13 | 37 | 7 | I | OM.F.EXT |
| | 22 | 12 | 34 | II | EC.F.PEN | | 21 | 43 | 19 | II | PA.F.EXT | | | | | | |
| | | | | | | | 21 | 41 | 11 | III | OC.D.EXT | | | | | | |

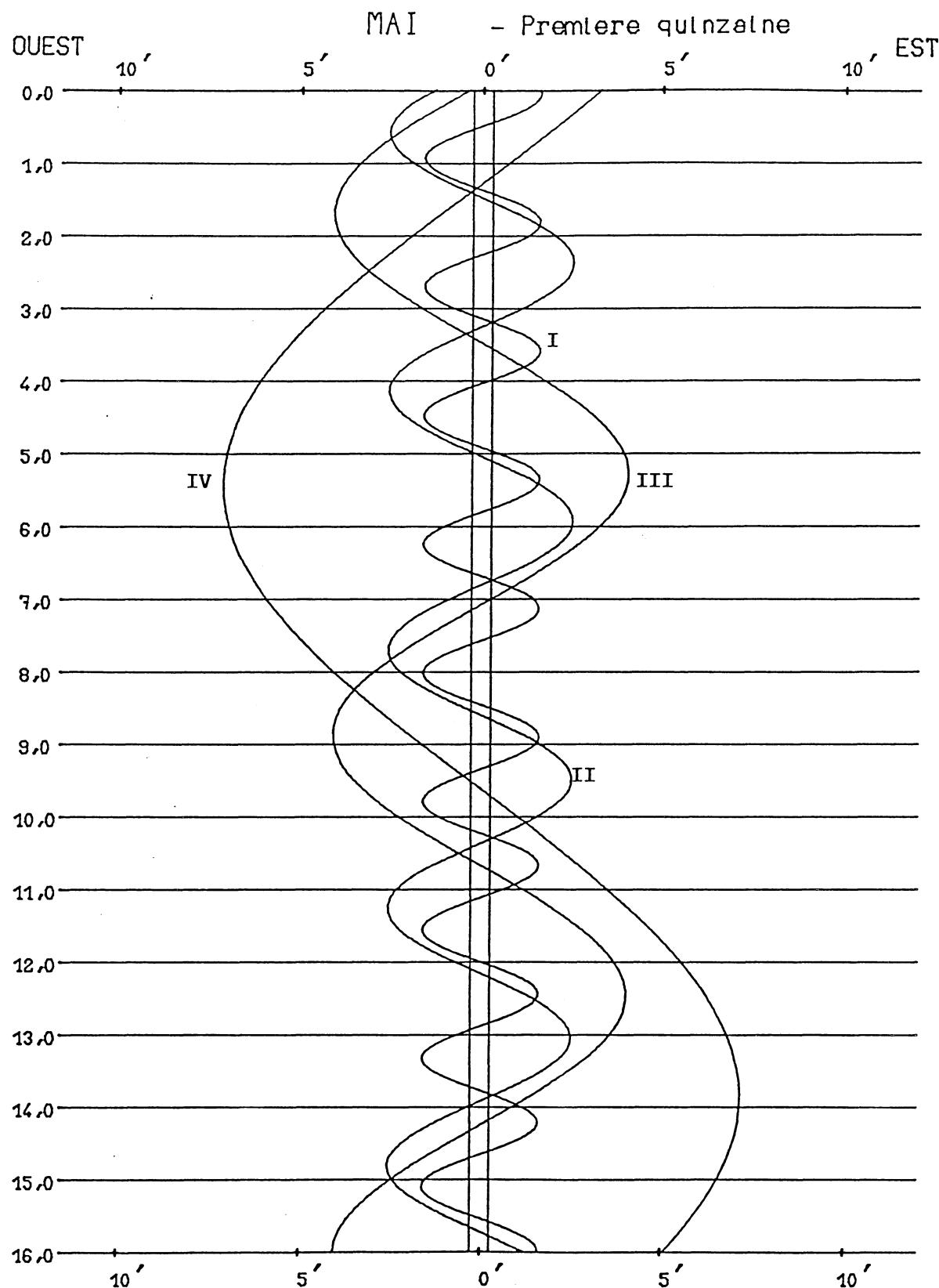


Dans le sens OUEST-EST, les satellites passent au-delà de Jupiter

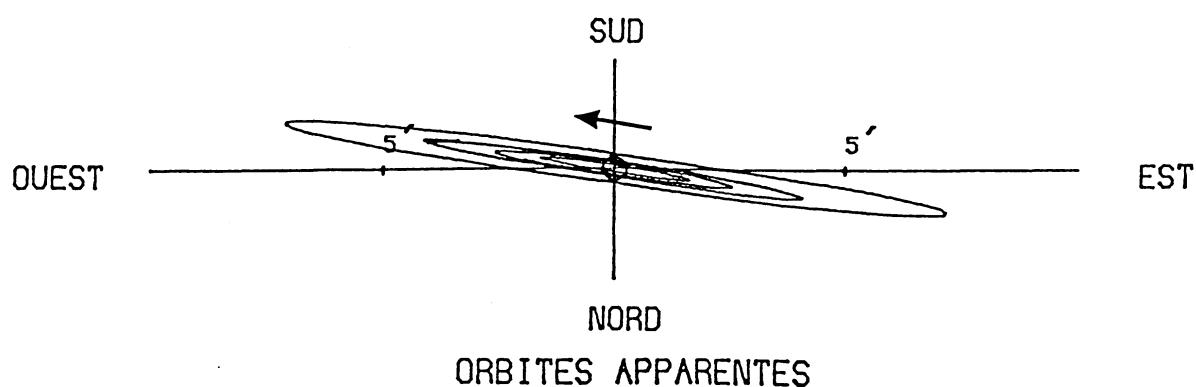


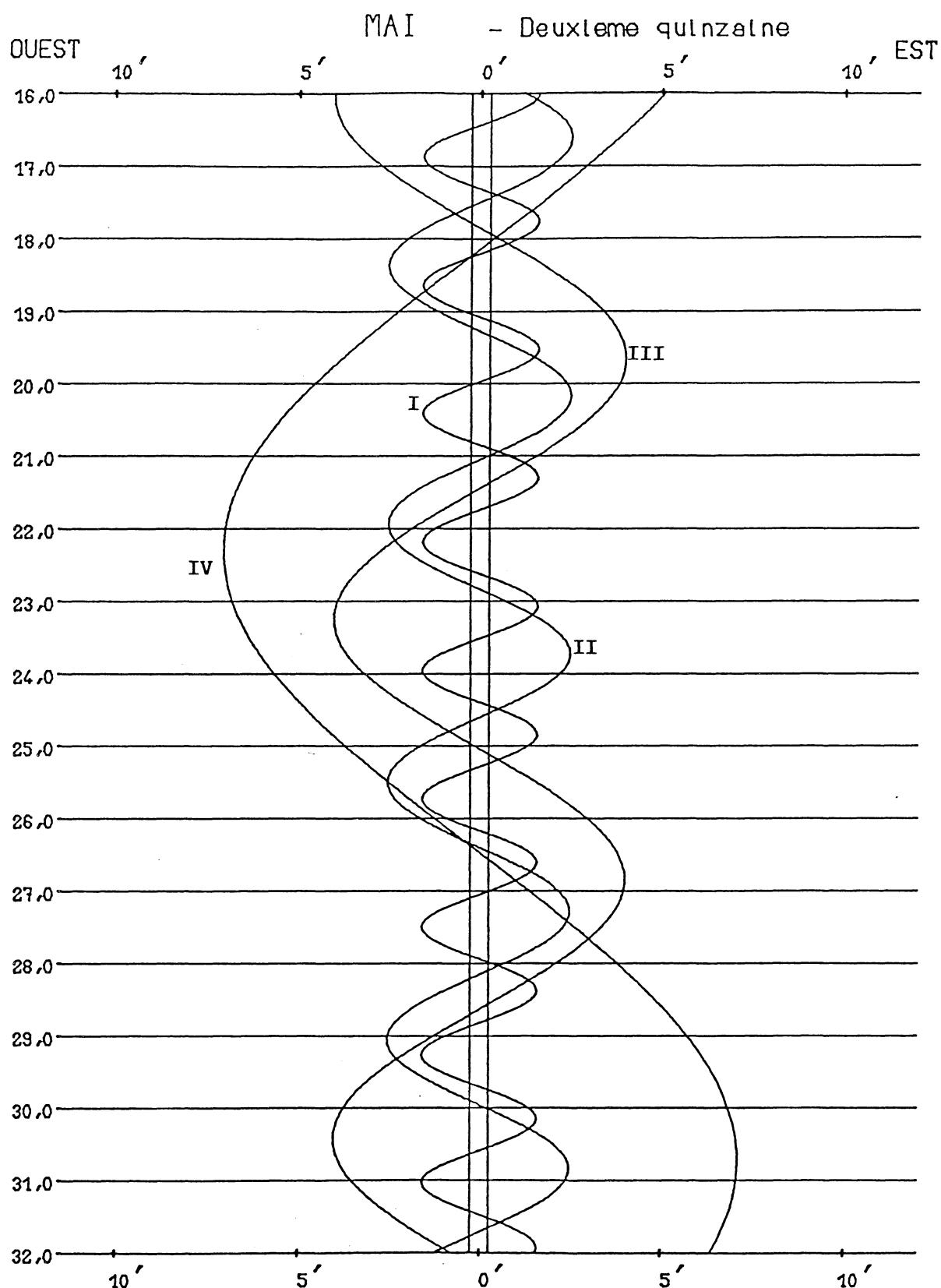
1989 - SATELLITES DE JUPITER -

| PHENOMENES | | | | | | MOIS : | | | MAI - PREMIERE QUINZAINE - | | | | | | | | |
|------------|----|----|-----|----------|----------|--------|----|----|----------------------------|----------|----------|------|----|----------|----------|----------|------|
| JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE |
| 1 | 7 | 54 | 39 | I | OC.D.EXT | 18 | 10 | 10 | I | EC.F.INT | 1 | 48 | 22 | I | PA.D.INT | | |
| | 7 | 58 | 25 | I | OC.D.INT | 18 | 13 | 57 | I | EC.F.EXT | 2 | 13 | 58 | I | OM.D.EXT | | |
| 10 | 18 | 59 | II | OC.D.EXT | 18 | 14 | 44 | I | EC.F.PEN | 2 | 17 | 47 | I | OM.D.INT | | | |
| 10 | 23 | 38 | II | OC.D.INT | 18 | 15 | 51 | II | PA.D.EXT | 3 | 56 | 45 | I | PA.F.INT | | | |
| 10 | 44 | 6 | I | EC.F.INT | 18 | 20 | 22 | II | PA.D.INT | 4 | 0 | 33 | I | PA.F.EXT | | | |
| 10 | 47 | 53 | I | EC.F.EXT | 19 | 21 | 47 | II | OM.D.EXT | 4 | 26 | 30 | I | OM.F.INT | | | |
| 10 | 48 | 39 | I | EC.F.PEN | 19 | 26 | 19 | II | OM.D.INT | 4 | 30 | 18 | I | OM.F.EXT | | | |
| 14 | 4 | 11 | II | EC.F.INT | 20 | 41 | 37 | II | PA.F.INT | 22 | 56 | 41 | I | OC.D.EXT | | | |
| 14 | 8 | 52 | II | EC.F.EXT | 20 | 46 | 9 | II | PA.F.EXT | 23 | 0 | 27 | I | OC.D.INT | | | |
| 14 | 10 | 43 | II | EC.F.PEN | 21 | 48 | 19 | II | OM.F.INT | | | | | | | | |
| | | | | | 21 | 52 | 51 | II | OM.F.EXT | 12 | 1 | 36 | 15 | I | EC.F.INT | | |
| 2 | 5 | 12 | 5 | I | PA.D.EXT | | | | | | 1 | 40 | 2 | I | EC.F.EXT | | |
| | 5 | 15 | 53 | I | PA.D.INT | 7 | 0 | 24 | 45 | III | PA.D.EXT | 1 | 40 | 48 | I | EC.F.PEN | |
| 5 | 49 | 53 | I | OM.D.EXT | | 0 | 36 | 50 | III | PA.D.INT | 2 | 36 | 15 | II | OC.D.EXT | | |
| 5 | 53 | 42 | I | OM.D.INT | | 2 | 40 | 15 | III | OM.D.EXT | 2 | 40 | 52 | II | OC.D.INT | | |
| 7 | 24 | 4 | I | PA.F.INT | | 2 | 52 | 33 | III | OM.D.INT | 6 | 1 | 10 | II | EC.F.INT | | |
| 7 | 27 | 52 | I | PA.F.EXT | | 2 | 57 | 42 | III | PA.F.INT | 6 | 5 | 50 | II | EC.F.EXT | | |
| 8 | 2 | 14 | I | OM.F.INT | | 3 | 9 | 48 | III | PA.F.EXT | 6 | 7 | 39 | II | EC.F.PEN | | |
| 8 | 6 | 3 | I | OM.F.EXT | | 5 | 12 | 6 | III | OM.F.INT | 20 | 15 | 10 | I | PA.D.EXT | | |
| | | | | | | 5 | 24 | 22 | III | OM.F.EXT | 20 | 18 | 57 | I | PA.D.INT | | |
| 3 | 2 | 24 | 57 | I | OC.D.EXT | 12 | 43 | 31 | I | PA.D.EXT | 20 | 42 | 50 | I | OM.D.INT | | |
| 2 | 28 | 44 | I | OC.D.INT | | 12 | 47 | 19 | I | PA.D.INT | 20 | 46 | 38 | I | OM.D.INT | | |
| 4 | 51 | 45 | II | PA.D.EXT | 13 | 16 | 20 | I | OM.D.EXT | 22 | 27 | 22 | I | PA.F.INT | | | |
| 4 | 56 | 16 | II | PA.D.INT | | 13 | 20 | 8 | I | OM.D.INT | 22 | 31 | 10 | I | PA.F.EXT | | |
| 5 | 12 | 47 | I | EC.F.INT | 14 | 55 | 38 | I | PA.F.INT | 22 | 55 | 24 | I | OM.F.INT | | | |
| 5 | 16 | 34 | I | EC.F.EXT | | 14 | 59 | 26 | I | PA.F.EXT | 22 | 59 | 12 | I | OM.F.EXT | | |
| 5 | 17 | 21 | I | EC.F.PEN | | 15 | 28 | 48 | I | OM.F.INT | | | | | | | |
| 6 | 4 | 14 | II | OM.D.EXT | | 15 | 32 | 36 | I | OM.F.EXT | 13 | 17 | 27 | 4 | I | OC.D.EXT | |
| 6 | 8 | 46 | II | OM.D.INT | | | | | | | 17 | 30 | 50 | I | OC.D.INT | | |
| 7 | 17 | 13 | II | PA.F.INT | 8 | 9 | 55 | 59 | I | OC.D.EXT | 20 | 4 | 55 | I | EC.F.INT | | |
| 7 | 21 | 45 | II | PA.F.EXT | | 9 | 59 | 45 | I | OC.D.INT | 20 | 8 | 42 | I | EC.F.EXT | | |
| 8 | 30 | 30 | II | OM.F.INT | | 12 | 38 | 54 | I | EC.F.INT | 20 | 9 | 29 | I | EC.F.PEN | | |
| 8 | 35 | 2 | II | OM.F.EXT | | 12 | 42 | 40 | I | EC.F.EXT | 21 | 4 | 28 | II | PA.D.EXT | | |
| 10 | 8 | 54 | III | OC.D.EXT | | 12 | 43 | 27 | I | EC.F.PEN | 21 | 8 | 59 | II | PA.D.INT | | |
| 10 | 21 | 1 | III | OC.D.INT | | 13 | 10 | 42 | II | OC.D.EXT | 21 | 56 | 59 | II | OM.D.INT | | |
| 15 | 6 | 18 | III | EC.F.INT | | 13 | 15 | 20 | II | OC.D.INT | 22 | 1 | 31 | II | OM.D.INT | | |
| 15 | 19 | 8 | III | EC.F.EXT | | 16 | 42 | 29 | II | EC.F.INT | 23 | 30 | 52 | II | PA.F.INT | | |
| 15 | 23 | 34 | III | EC.F.PEN | | 16 | 47 | 9 | II | EC.F.EXT | 23 | 35 | 23 | II | PA.F.EXT | | |
| 23 | 42 | 32 | I | PA.D.EXT | | 16 | 48 | 59 | II | EC.F.PEN | | | | | | | |
| 23 | 46 | 20 | I | PA.D.INT | | | | | | | 14 | 0 | 24 | 2 | II | OM.F.INT | |
| | | | | | | 9 | 7 | 14 | 5 | I | PA.D.EXT | 0 | 28 | 33 | II | OM.F.EXT | |
| 4 | 0 | 18 | 41 | I | OM.D.EXT | | 7 | 17 | 53 | I | PA.D.INT | 4 | 54 | 5 | III | PA.D.EXT | |
| 0 | 22 | 30 | I | OM.D.INT | | 7 | 45 | 12 | I | OM.D.EXT | 5 | 6 | 6 | III | PA.D.INT | | |
| 1 | 54 | 33 | I | PA.F.INT | | 7 | 49 | 0 | I | OM.D.INT | 6 | 41 | 27 | III | OM.D.EXT | | |
| 1 | 58 | 22 | I | PA.F.EXT | | 9 | 26 | 13 | I | PA.F.INT | 6 | 53 | 40 | III | OM.D.INT | | |
| 2 | 31 | 5 | I | OM.F.INT | | 9 | 30 | 1 | I | PA.F.EXT | 7 | 27 | 55 | III | PA.F.INT | | |
| 2 | 34 | 53 | I | OM.F.EXT | | 9 | 57 | 41 | I | OM.F.INT | 7 | 39 | 58 | III | PA.F.EXT | | |
| 20 | 55 | 17 | I | OC.D.EXT | | 10 | 1 | 29 | I | OM.F.EXT | 9 | 14 | 17 | III | OM.F.INT | | |
| 20 | 59 | 3 | I | OC.D.INT | | | | | | | 9 | 26 | 29 | III | OM.F.EXT | | |
| 23 | 41 | 29 | I | EC.F.INT | 10 | 4 | 26 | 20 | I | OC.D.EXT | 14 | 45 | 38 | I | PA.D.EXT | | |
| 23 | 44 | 23 | II | OC.D.EXT | | 4 | 30 | 6 | I | OC.D.INT | 14 | 49 | 25 | I | PA.D.INT | | |
| 23 | 45 | 16 | I | EC.F.EXT | | 7 | 7 | 34 | I | EC.F.INT | 15 | 11 | 34 | I | OM.D.EXT | | |
| 23 | 46 | 3 | I | EC.F.PEN | | 7 | 11 | 21 | I | EC.F.EXT | 15 | 15 | 22 | I | OM.D.INT | | |
| 23 | 49 | 1 | II | OC.D.INT | | 7 | 12 | 7 | I | EC.F.PEN | 16 | 57 | 52 | I | PA.F.INT | | |
| | | | | | | 7 | 40 | 8 | II | PA.D.EXT | 17 | 1 | 40 | I | PA.F.EXT | | |
| 5 | 3 | 22 | 57 | II | EC.F.INT | | 7 | 44 | 39 | II | PA.D.INT | 17 | 24 | 10 | I | OM.F.INT | |
| 3 | 27 | 38 | II | EC.F.EXT | | 8 | 39 | 25 | II | OM.D.EXT | 17 | 27 | 58 | I | OM.F.EXT | | |
| 3 | 29 | 28 | II | EC.F.PEN | | 8 | 43 | 56 | II | OM.D.INT | | | | | | | |
| 18 | 13 | 5 | I | PA.D.EXT | 10 | 6 | 13 | II | PA.F.INT | 15 | 11 | 57 | 28 | I | OC.D.EXT | | |
| 18 | 16 | 53 | I | PA.D.INT | | 10 | 10 | 44 | II | PA.F.EXT | 12 | 1 | 14 | I | OC.D.INT | | |
| 18 | 47 | 34 | I | OM.D.EXT | | 11 | 6 | 12 | II | OM.F.INT | 14 | 33 | 38 | I | EC.F.INT | | |
| 18 | 51 | 23 | I | OM.D.INT | | 11 | 10 | 43 | II | OM.F.EXT | 14 | 37 | 24 | I | EC.F.EXT | | |
| 20 | 25 | 9 | I | PA.F.INT | | 14 | 36 | 51 | III | OC.D.EXT | 14 | 38 | 11 | I | EC.F.PEN | | |
| 20 | 28 | 57 | I | PA.F.EXT | | 14 | 48 | 55 | III | OC.D.INT | 16 | 2 | 39 | II | OC.D.EXT | | |
| 21 | 0 | 0 | I | OM.F.INT | | 19 | 7 | 17 | III | EC.F.INT | 16 | 7 | 15 | II | OC.D.INT | | |
| 21 | 3 | 48 | I | OM.F.EXT | | 19 | 20 | 1 | III | EC.F.EXT | 19 | 20 | 35 | II | EC.F.INT | | |
| | | | | | | 19 | 24 | 26 | III | EC.F.PEN | 19 | 25 | 14 | II | EC.F.EXT | | |
| 6 | 15 | 25 | 37 | I | OC.D.EXT | | | | I | PA.D.EXT | 19 | 27 | 3 | II | EC.F.PEN | | |
| | 15 | 29 | 23 | I | OC.D.INT | 11 | 1 | 44 | 34 | I | PA.D.EXT | | | | | | |

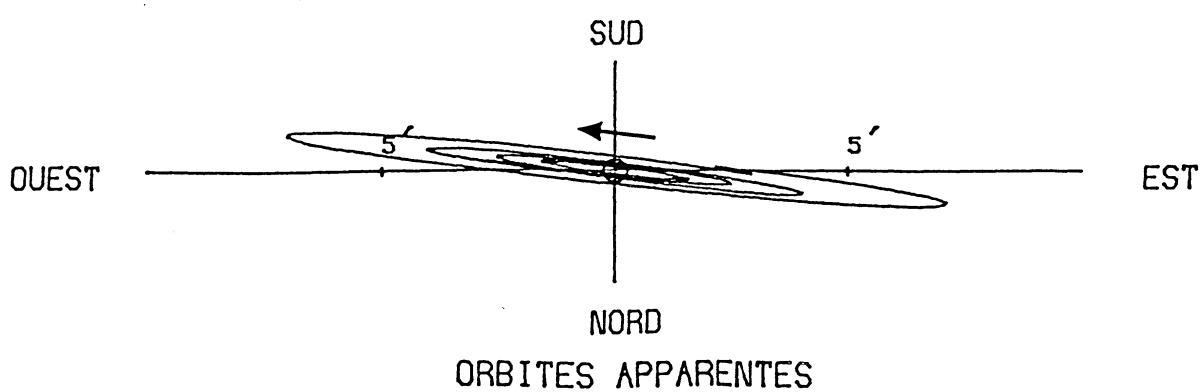


Dans le sens OUEST-EST, les satellites passent au-delà de Jupiter

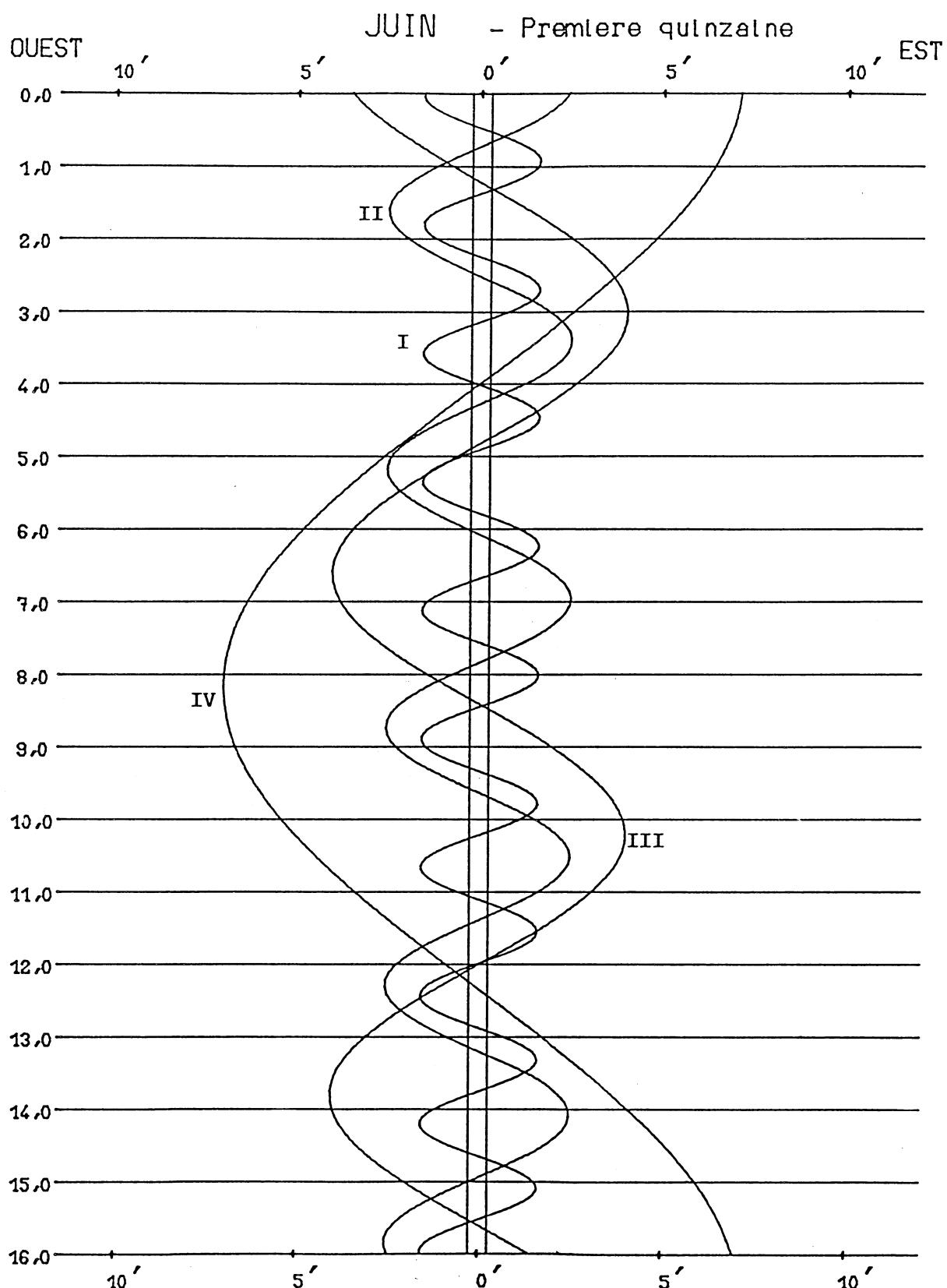




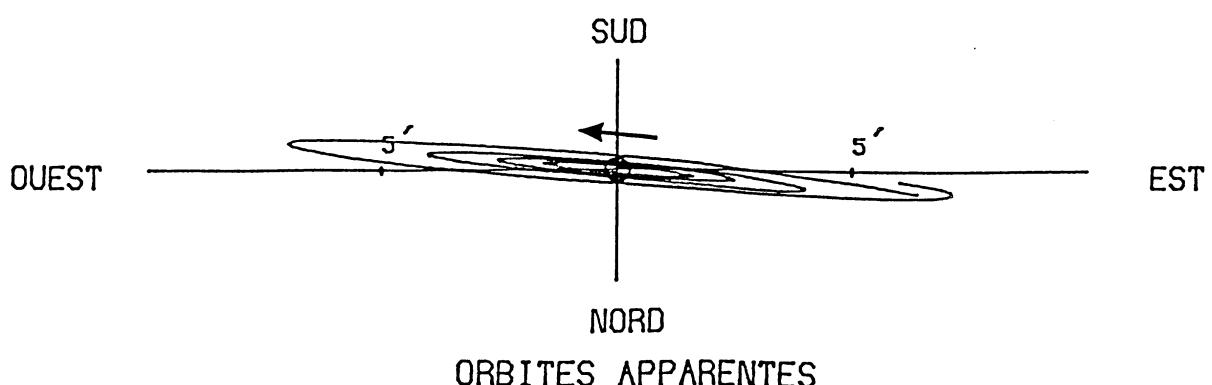
Dans le sens OUEST-EST, les satellites passent au-delà de Jupiter



| PHENOMENES | | | | | | MOIS : | | | JUIN - PREMIERE QUINZAINE - | | | | | | | | |
|------------|----|----|----|-----|----------|--------|----|----|-----------------------------|-----|----------|------|----|----|-----|----------|----------|
| JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE |
| 1 | 4 | 4 | 5 | III | OC.D.EXT | 6 | 0 | 38 | 41 | II | OC.D.EXT | 8 | 26 | 15 | II | PA.D.INT | |
| | 4 | 15 | 56 | III | OC.D.INT | | 0 | 43 | 13 | II | OC.D.INT | 10 | 46 | 43 | II | OM.F.INT | |
| | 7 | 9 | 45 | III | EC.F.INT | | 3 | 13 | 43 | II | EC.F.INT | 10 | 50 | 48 | II | PA.F.INT | |
| | 7 | 22 | 14 | III | EC.F.EXT | | 3 | 18 | 19 | II | EC.F.EXT | 10 | 51 | 13 | II | OM.F.EXT | |
| | 7 | 26 | 34 | III | EC.F.PEN | | 3 | 20 | 7 | II | EC.F.PEN | 10 | 55 | 15 | II | PA.F.EXT | |
| | 7 | 51 | 7 | I | PA.D.EXT | | 15 | 22 | 46 | I | PA.D.EXT | 22 | 42 | 13 | III | OM.D.EXT | |
| | 7 | 54 | 54 | I | PA.D.INT | | 15 | 25 | 24 | I | OM.D.EXT | 22 | 51 | 28 | I | OM.D.EXT | |
| | 7 | 59 | 13 | I | OM.D.EXT | | 15 | 26 | 33 | I | PA.D.INT | 22 | 52 | 38 | III | PA.D.EXT | |
| | 8 | 3 | 1 | I | OM.D.INT | | 15 | 29 | 12 | I | OM.D.INT | 22 | 54 | 7 | III | OM.D.INT | |
| | 10 | 3 | 36 | I | PA.F.INT | | 17 | 35 | 17 | I | PA.F.INT | 22 | 54 | 17 | I | PA.D.EXT | |
| | 10 | 7 | 23 | I | PA.F.EXT | | 17 | 38 | 15 | I | OM.F.INT | 22 | 55 | 15 | I | OM.D.INT | |
| | 10 | 12 | 1 | I | OM.F.INT | | 17 | 39 | 4 | I | PA.F.EXT | 22 | 58 | 4 | I | PA.D.INT | |
| | 10 | 15 | 49 | I | OM.F.EXT | | 17 | 42 | 2 | I | OM.F.EXT | 23 | 4 | 22 | III | PA.D.INT | |
| 2 | 5 | 1 | 29 | I | OC.D.EXT | 7 | 12 | 32 | 43 | I | OC.D.EXT | 12 | 1 | 4 | 20 | I | OM.F.INT |
| | 5 | 5 | 15 | I | OC.D.INT | | 12 | 36 | 28 | I | OC.D.INT | 1 | 6 | 51 | I | PA.F.INT | |
| | 7 | 20 | 12 | I | EC.F.INT | | 14 | 46 | 6 | I | EC.F.INT | 1 | 8 | 7 | I | OM.F.EXT | |
| | 7 | 23 | 58 | I | EC.F.EXT | | 14 | 49 | 52 | I | EC.F.EXT | 1 | 10 | 38 | I | PA.F.EXT | |
| | 7 | 24 | 45 | I | EC.F.PEN | | 14 | 50 | 39 | I | EC.F.PEN | 1 | 18 | 50 | III | OM.F.INT | |
| | 11 | 12 | 23 | II | OC.D.EXT | | 18 | 56 | 57 | II | PA.D.EXT | 1 | 30 | 16 | III | PA.F.INT | |
| | 11 | 16 | 56 | II | OC.D.INT | | 19 | 0 | 5 | II | OM.D.EXT | 1 | 30 | 45 | III | OM.F.EXT | |
| | 13 | 54 | 40 | II | EC.F.INT | | 19 | 1 | 25 | II | PA.D.INT | 1 | 42 | 0 | III | PA.F.EXT | |
| | 13 | 59 | 16 | II | EC.F.EXT | | 19 | 4 | 35 | II | OM.D.INT | 20 | 0 | 13 | I | EC.D.PEN | |
| | 14 | 1 | 4 | II | EC.F.PEN | | 21 | 25 | 37 | II | PA.F.INT | 20 | 1 | 0 | I | EC.D.EXT | |
| | 23 | 31 | 53 | I | OC.D.EXT | | 21 | 28 | 52 | II | OM.F.INT | 20 | 4 | 46 | I | EC.D.INT | |
| | 23 | 35 | 39 | I | OC.D.INT | | 21 | 30 | 5 | II | PA.F.EXT | 22 | 16 | 10 | I | OC.F.INT | |
| | 2 | 25 | 30 | I | PA.D.INT | | 21 | 33 | 21 | II | OM.F.EXT | 22 | 19 | 56 | I | OC.F.EXT | |
| | 2 | 28 | 0 | I | OM.D.EXT | | | | | | | | | | | | |
| | 2 | 31 | 47 | I | OM.D.INT | 8 | 8 | 34 | 41 | III | OC.D.EXT | 13 | 3 | 22 | 25 | II | EC.D.PEN |
| | 4 | 34 | 13 | I | PA.F.INT | | 8 | 46 | 29 | III | OC.D.INT | | 3 | 24 | 12 | II | EC.D.EXT |
| | 4 | 38 | 0 | I | PA.F.EXT | | 9 | 53 | 15 | I | PA.D.EXT | | 3 | 28 | 47 | II | EC.D.INT |
| | 4 | 40 | 49 | I | OM.F.INT | | 9 | 54 | 5 | I | OM.D.EXT | | 6 | 0 | 40 | II | OC.F.INT |
| | 4 | 44 | 36 | I | OM.F.EXT | | 9 | 57 | 2 | I | PA.D.INT | | 6 | 5 | 10 | II | OC.F.EXT |
| | 23 | 31 | 53 | I | OC.D.EXT | | 9 | 57 | 52 | I | OM.D.INT | | 17 | 20 | 11 | I | OM.D.EXT |
| | 23 | 35 | 39 | I | OC.D.INT | | 11 | 11 | 26 | III | EC.F.INT | | 17 | 23 | 58 | I | OM.D.EXT |
| | 23 | 35 | 39 | I | OC.D.INT | | 11 | 23 | 50 | III | EC.F.EXT | | 17 | 24 | 50 | I | PA.D.EXT |
| 4 | 1 | 48 | 49 | I | EC.F.INT | | 11 | 28 | 9 | III | EC.F.PEN | 14 | 28 | 36 | I | PA.D.INT | |
| | 1 | 52 | 35 | I | EC.F.EXT | | 12 | 5 | 48 | I | PA.F.INT | 19 | 33 | 3 | I | OM.F.INT | |
| | 1 | 53 | 22 | I | EC.F.PEN | | 12 | 6 | 56 | I | OM.F.INT | 19 | 36 | 50 | I | OM.F.EXT | |
| | 5 | 32 | 10 | II | PA.D.EXT | | 12 | 9 | 35 | I | PA.F.EXT | 19 | 37 | 24 | I | PA.F.INT | |
| | 5 | 36 | 39 | II | PA.D.INT | | 12 | 10 | 43 | I | OM.F.EXT | 19 | 41 | 11 | I | PA.F.EXT | |
| | 5 | 42 | 30 | II | OM.D.EXT | | | | | | | | | | | | |
| | 5 | 47 | 0 | II | OM.D.INT | 9 | 7 | 3 | 1 | I | EC.D.PEN | 14 | 28 | 47 | I | EC.D.PEN | |
| | 8 | 0 | 31 | II | PA.F.INT | | 7 | 3 | 7 | I | OC.D.EXT | 14 | 29 | 34 | I | EC.D.EXT | |
| | 8 | 4 | 59 | II | PA.F.EXT | | 7 | 6 | 53 | I | OC.D.INT | 14 | 33 | 20 | I | EC.D.INT | |
| | 8 | 11 | 3 | II | OM.F.INT | | 9 | 15 | 17 | I | OC.F.INT | 16 | 46 | 34 | I | OC.F.INT | |
| | 8 | 15 | 33 | II | OM.F.EXT | | 9 | 19 | 3 | I | OC.F.EXT | 16 | 50 | 20 | I | OC.F.EXT | |
| | 18 | 23 | 17 | III | PA.D.EXT | | 9 | 19 | 17 | I | EC.F.PEN | 21 | 35 | 19 | II | OM.D.EXT | |
| | 18 | 35 | 6 | III | PA.D.INT | | 14 | 4 | 13 | II | OC.D.EXT | 21 | 39 | 48 | II | OM.D.INT | |
| | 18 | 42 | 42 | III | OM.D.EXT | | 14 | 8 | 45 | II | OC.D.INT | 21 | 46 | 37 | II | PA.D.EXT | |
| | 18 | 54 | 41 | III | OM.D.INT | | 16 | 34 | 21 | II | OC.F.INT | 21 | 51 | 4 | II | PA.D.INT | |
| | 20 | 52 | 12 | I | PA.D.EXT | | 16 | 38 | 52 | II | OC.F.EXT | | | | | | |
| | 20 | 55 | 59 | I | PA.D.INT | | | | | | | | | | | | |
| | 20 | 56 | 39 | I | OM.D.EXT | 10 | 4 | 22 | 50 | I | OM.D.EXT | 15 | 0 | 4 | 34 | II | OM.F.INT |
| | 20 | 59 | 56 | III | PA.F.INT | | 4 | 23 | 50 | I | PA.D.EXT | 0 | 15 | 57 | II | PA.F.INT | |
| | 21 | 0 | 27 | I | OM.D.INT | | 4 | 26 | 37 | I | OM.D.INT | 0 | 20 | 24 | II | PA.F.EXT | |
| | 21 | 11 | 45 | III | PA.F.EXT | | 4 | 27 | 37 | I | PA.D.INT | 11 | 48 | 50 | I | OM.D.EXT | |
| | 21 | 18 | 24 | III | OM.F.INT | | 6 | 35 | 41 | I | OM.F.INT | 11 | 52 | 37 | I | OM.D.INT | |
| | 21 | 30 | 23 | III | OM.F.EXT | | 6 | 36 | 23 | I | PA.F.INT | 11 | 55 | 17 | I | PA.D.EXT | |
| | 23 | 4 | 43 | I | PA.F.INT | | 6 | 39 | 28 | I | OM.F.EXT | 11 | 59 | 4 | I | PA.D.INT | |
| | 23 | 8 | 30 | I | PA.F.EXT | | 6 | 40 | 10 | I | PA.F.EXT | 12 | 39 | 10 | III | EC.D.PEN | |
| | 23 | 9 | 30 | I | OM.F.INT | | | | | | | 12 | 43 | 27 | III | EC.D.EXT | |
| | 23 | 13 | 17 | I | OM.F.EXT | 11 | 1 | 31 | 36 | I | EC.D.PEN | 12 | 55 | 45 | III | EC.D.INT | |
| | | | | | | | 1 | 32 | 22 | I | EC.D.EXT | 14 | 1 | 42 | I | OM.F.INT | |
| 5 | 18 | 2 | 19 | I | OC.D.EXT | | 1 | 36 | 9 | I | EC.D.INT | 14 | 5 | 29 | I | OM.F.EXT | |
| | 18 | 6 | 5 | I | OC.D.INT | | 3 | 45 | 42 | I | OC.F.INT | 14 | 7 | 52 | I | PA.F.INT | |
| | 20 | 17 | 29 | I | EC.F.INT | | 3 | 49 | 27 | I | OC.F.EXT | 14 | 11 | 39 | I | PA.F.EXT | |
| | 20 | 21 | 15 | I | EC.F.EXT | | 8 | 17 | 42 | II | OM.D.EXT | 15 | 43 | 28 | III | OC.F.INT | |
| | 20 | 22 | 2 | I | EC.F.PEN | | 8 | 21 | 48 | II | PA.D.EXT | 15 | 55 | 11 | III | OC.F.EXT | |
| | | | | | | | 8 | 22 | 11 | II | OM.D.INT | | | | | | |

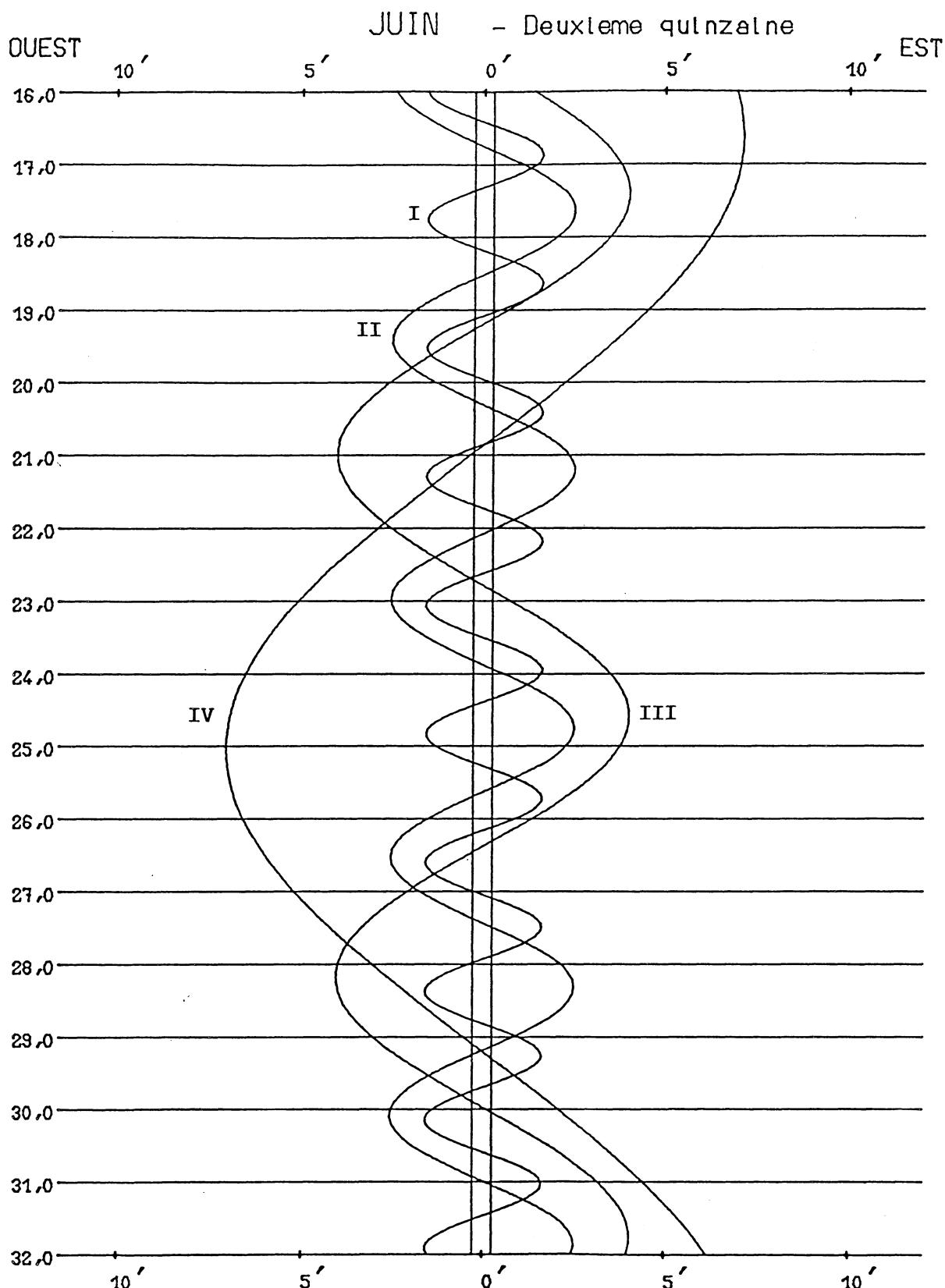


Dans le sens OUEST-EST, les satellites passent au-delà de Jupiter

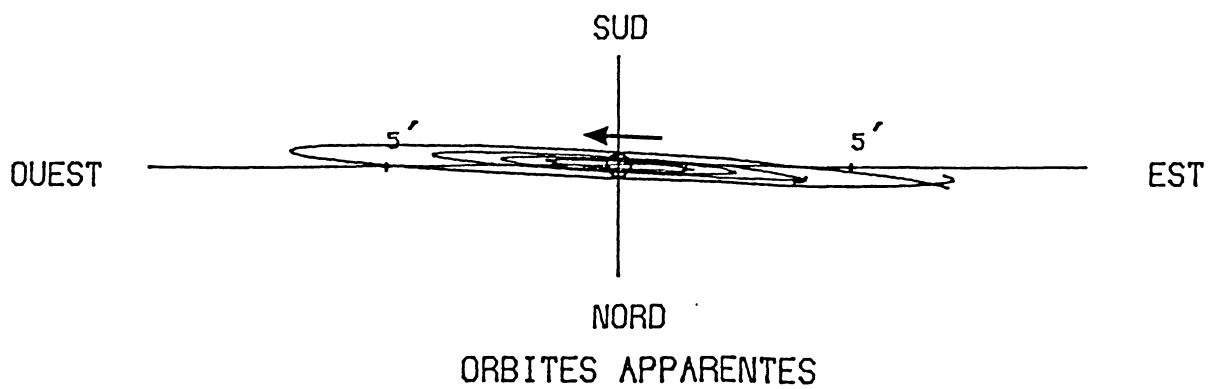


1989 - SATELLITES DE JUPITER -

| PHENOMENES | | | | | MOIS : | | | JUIN - DEUXIEME QUINZAINE - | | | | | | | | | | |
|------------|----|----|--------------|-----|----------|------|----|-----------------------------|----|----------|----------|------|----|----|----------|--------------|------|--|
| JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE | |
| 16 | 8 | 57 | 22 | I | EC.D.PEN | 21 | 43 | 5 | I | PA.F.EXT | 4 | 53 | 39 | I | OM.F.INT | | | |
| | 8 | 58 | 9 | I | EC.D.EXT | | | | | | | 4 | 57 | 26 | I | OM.F.EXT | | |
| 9 | 1 | 55 | I EC.D.INT | | | 21 | 16 | 23 | 6 | I | EC.D.PEN | 5 | 10 | 35 | I | PA.F.INT | | |
| 11 | 17 | 0 | I OC.F.INT | | | | 16 | 23 | 52 | I | EC.D.EXT | 5 | 14 | 21 | I | PA.F.EXT | | |
| 11 | 20 | 46 | I OC.F.EXT | | | | 16 | 27 | 39 | I | EC.D.INT | 6 | 41 | 38 | III | OM.D.EXT | | |
| 16 | 40 | 29 | II EC.D.PEN | | | | 18 | 48 | 13 | I | OC.F.INT | 6 | 53 | 22 | III | OM.D.INT | | |
| 16 | 42 | 16 | II EC.D.EXT | | | | 18 | 51 | 59 | I | OC.F.EXT | 7 | 50 | 55 | III | PA.D.EXT | | |
| 16 | 46 | 50 | II EC.D.INT | | | | | | | | | 8 | 2 | 29 | III | PA.D.INT | | |
| 19 | 26 | 20 | II OC.F.INT | | | 22 | 0 | 10 | 35 | II | OM.D.EXT | 9 | 20 | 3 | III | OM.F.INT | | |
| 19 | 30 | 50 | II OC.F.EXT | | | | 0 | 15 | 4 | II | OM.D.INT | 9 | 31 | 49 | III | OM.F.EXT | | |
| | | | | | | | 0 | 36 | 14 | II | PA.D.EXT | 10 | 30 | 35 | III | PA.F.INT | | |
| 17 | 6 | 17 | 34 | I | OM.D.EXT | | 0 | 40 | 40 | II | PA.D.INT | 10 | 42 | 9 | III | PA.F.EXT | | |
| 6 | 21 | 21 | I OM.D.INT | | | | 2 | 40 | 18 | II | OM.F.INT | 23 | 48 | 49 | I | EC.D.PEN | | |
| 6 | 25 | 49 | I PA.D.EXT | | | | 2 | 44 | 46 | II | OM.F.EXT | 23 | 49 | 36 | I | EC.D.EXT | | |
| 6 | 29 | 36 | I PA.D.INT | | | | 3 | 6 | 13 | II | PA.F.INT | 23 | 53 | 22 | I | EC.D.INT | | |
| 8 | 30 | 26 | I OM.F.INT | | | | 3 | 10 | 40 | II | PA.F.EXT | | | | | | | |
| 8 | 34 | 13 | I OM.F.EXT | | | | 13 | 43 | 29 | I | OM.D.EXT | 27 | 2 | 19 | 25 | I OC.F.INT | | |
| 8 | 38 | 24 | I PA.F.INT | | | | 13 | 47 | 16 | I | OM.D.INT | | 2 | 23 | 10 | I OC.F.EXT | | |
| 8 | 42 | 11 | I PA.F.EXT | | | | 13 | 57 | 8 | I | PA.D.EXT | | 8 | 35 | 30 | II EC.D.PEN | | |
| | | | | | | | 14 | 0 | 54 | I | PA.D.INT | | 8 | 37 | 16 | II EC.D.EXT | | |
| 18 | 3 | 25 | 56 | I | EC.D.PEN | | 15 | 56 | 22 | I | OM.F.INT | | 8 | 41 | 49 | II EC.D.INT | | |
| 3 | 26 | 42 | I EC.D.EXT | | | | 16 | 0 | 9 | I | OM.F.EXT | | 11 | 43 | 44 | II OC.F.INT | | |
| 3 | 30 | 29 | I EC.D.INT | | | | 16 | 9 | 44 | I | PA.F.INT | | 11 | 48 | 11 | II OC.F.EXT | | |
| 5 | 47 | 23 | I OC.F.INT | | | | 16 | 13 | 30 | I | PA.F.EXT | | 21 | 9 | 27 | I OM.D.INT | | |
| 5 | 51 | 9 | I OC.F.EXT | | | | 16 | 39 | 23 | III | EC.D.PEN | | 21 | 13 | 14 | I OM.D.EXT | | |
| 10 | 52 | 59 | II OM.D.EXT | | | | 16 | 43 | 38 | III | EC.D.INT | | 21 | 28 | 24 | I PA.D.EXT | | |
| 10 | 57 | 27 | II OM.D.INT | | | | 16 | 55 | 51 | III | EC.D.INT | | 21 | 32 | 10 | I PA.D.INT | | |
| 11 | 11 | 28 | II PA.D.EXT | | | | 20 | 14 | 20 | III | OC.F.INT | | 23 | 22 | 19 | I OM.F.INT | | |
| 11 | 15 | 55 | II PA.D.INT | | | | 20 | 25 | 57 | III | OC.F.EXT | | 23 | 26 | 6 | I OM.F.EXT | | |
| 13 | 22 | 28 | II OM.F.INT | | | | | | | | | | 23 | 41 | 0 | I PA.F.INT | | |
| 13 | 26 | 57 | II OM.F.EXT | | | 23 | 10 | 51 | 41 | I | EC.D.PEN | | 23 | 44 | 46 | I PA.F.EXT | | |
| 13 | 41 | 8 | II PA.F.INT | | | | 10 | 52 | 27 | I | EC.D.EXT | | | | | | | |
| 13 | 45 | 35 | II PA.F.EXT | | | | 10 | 56 | 14 | I | EC.D.INT | 28 | 18 | 17 | 22 | I EC.D.PEN | | |
| | | | | | | | 13 | 18 | 38 | I | OC.F.INT | | 18 | 18 | 8 | I EC.D.EXT | | |
| 19 | 0 | 46 | 10 | I | OM.D.EXT | | 13 | 22 | 23 | I | OC.F.EXT | | 18 | 21 | 54 | I EC.D.INT | | |
| 0 | 49 | 57 | I OM.D.INT | | | | 19 | 17 | 5 | II | EC.D.PEN | | 20 | 49 | 45 | I OC.F.INT | | |
| 0 | 56 | 14 | I PA.D.EXT | | | | 19 | 18 | 52 | II | EC.D.INT | | 20 | 53 | 31 | I OC.F.EXT | | |
| 1 | 0 | 1 | I PA.D.INT | | | | 19 | 23 | 25 | II | EC.D.INT | | | | | | | |
| 2 | 41 | 54 | III OM.D.EXT | | | 24 | 22 | 17 | 57 | II | OC.F.INT | 29 | 2 | 45 | 57 | II OM.D.EXT | | |
| 2 | 53 | 43 | III OM.D.INT | | | | 22 | 22 | 25 | II | OC.F.EXT | | 2 | 50 | 25 | II OM.D.INT | | |
| 2 | 59 | 3 | I OM.F.INT | | | | | | | | | | 3 | 25 | 47 | II PA.D.EXT | | |
| 3 | 2 | 50 | I OM.F.EXT | | | | 8 | 12 | 12 | I | OM.D.EXT | | 3 | 30 | 12 | II PA.D.INT | | |
| 3 | 8 | 50 | I PA.F.INT | | | | 8 | 15 | 58 | I | OM.D.INT | | 5 | 16 | 5 | II OM.F.INT | | |
| 3 | 12 | 36 | I PA.F.EXT | | | | 8 | 27 | 37 | I | PA.D.EXT | | 5 | 20 | 33 | II OM.F.EXT | | |
| 3 | 21 | 55 | III PA.D.EXT | | | | 8 | 31 | 23 | I | PA.D.INT | | 5 | 56 | 26 | II PA.F.INT | | |
| 3 | 33 | 34 | III PA.D.INT | | | | 10 | 25 | 4 | I | OM.F.INT | | 6 | 0 | 51 | II PA.F.EXT | | |
| 5 | 19 | 25 | III OM.F.INT | | | | 10 | 28 | 51 | I | OM.F.EXT | | 15 | 38 | 3 | I OM.D.INT | | |
| 5 | 31 | 16 | III OM.F.EXT | | | | 10 | 40 | 12 | I | PA.F.INT | | 15 | 41 | 50 | I OM.D.EXT | | |
| 6 | 0 | 33 | III PA.F.INT | | | | 10 | 43 | 59 | I | PA.F.EXT | | 15 | 58 | 45 | I PA.D.EXT | | |
| 6 | 12 | 12 | III PA.F.EXT | | | | | | | | | | 16 | 2 | 31 | I PA.D.INT | | |
| 21 | 54 | 33 | I EC.D.PEN | | | 25 | 5 | 20 | 13 | I | EC.D.PEN | | 17 | 50 | 55 | I OM.F.INT | | |
| 21 | 55 | 19 | I EC.D.EXT | | | | 5 | 21 | 0 | I | EC.D.EXT | | 17 | 54 | 41 | I OM.F.EXT | | |
| 21 | 59 | 6 | I EC.D.INT | | | | 5 | 24 | 46 | I | EC.D.INT | | 18 | 11 | 21 | I PA.F.EXT | | |
| | | | | | | | 7 | 48 | 59 | I | OC.F.INT | | 18 | 15 | 7 | I PA.F.EXT | | |
| 20 | 0 | 17 | 51 | I | OC.F.INT | | 7 | 52 | 45 | I | OC.F.EXT | | 20 | 38 | 49 | III EC.D.PEN | | |
| 0 | 21 | 36 | I OC.F.EXT | | | | 13 | 28 | 18 | II | OM.D.EXT | | 20 | 43 | 3 | III EC.D.EXT | | |
| 5 | 59 | 4 | II EC.D.PEN | | | | 13 | 32 | 46 | II | OM.D.INT | | 20 | 55 | 10 | III EC.D.INT | | |
| 6 | 0 | 51 | II EC.D.EXT | | | | 14 | 1 | 4 | II | PA.D.EXT | | | | | | | |
| 6 | 5 | 25 | II EC.D.INT | | | | 14 | 5 | 30 | II | PA.D.INT | 30 | 0 | 44 | 2 | III OC.F.INT | | |
| 8 | 52 | 25 | II OC.F.INT | | | | 15 | 58 | 15 | II | OM.F.INT | | 0 | 55 | 35 | III OC.F.EXT | | |
| 8 | 56 | 54 | II OC.F.EXT | | | | 16 | 2 | 43 | II | OM.F.EXT | | 12 | 45 | 56 | I EC.D.PEN | | |
| 19 | 14 | 52 | I OM.D.EXT | | | | 16 | 31 | 24 | II | PA.F.INT | | 12 | 46 | 42 | I EC.D.EXT | | |
| 19 | 18 | 39 | I OM.D.INT | | | | 16 | 35 | 50 | II | PA.F.EXT | | 12 | 50 | 28 | I EC.D.INT | | |
| 19 | 26 | 43 | I PA.D.EXT | | | | | | | | | | 15 | 20 | 7 | I OC.F.INT | | |
| 19 | 30 | 30 | I PA.D.INT | | | 26 | 2 | 40 | 47 | I | OM.D.EXT | | 15 | 23 | 53 | I OC.F.EXT | | |
| 21 | 27 | 45 | I OM.F.INT | | | | 2 | 44 | 34 | I | OM.D.INT | | 21 | 53 | 24 | II EC.D.PEN | | |
| 21 | 31 | 31 | I OM.F.EXT | | | | 2 | 57 | 59 | I | PA.D.EXT | | 21 | 55 | 10 | II EC.D.EXT | | |
| 21 | 39 | 19 | I PA.F.INT | | | | 3 | 1 | 45 | I | PA.D.INT | | 21 | 59 | 42 | II EC.D.INT | | |

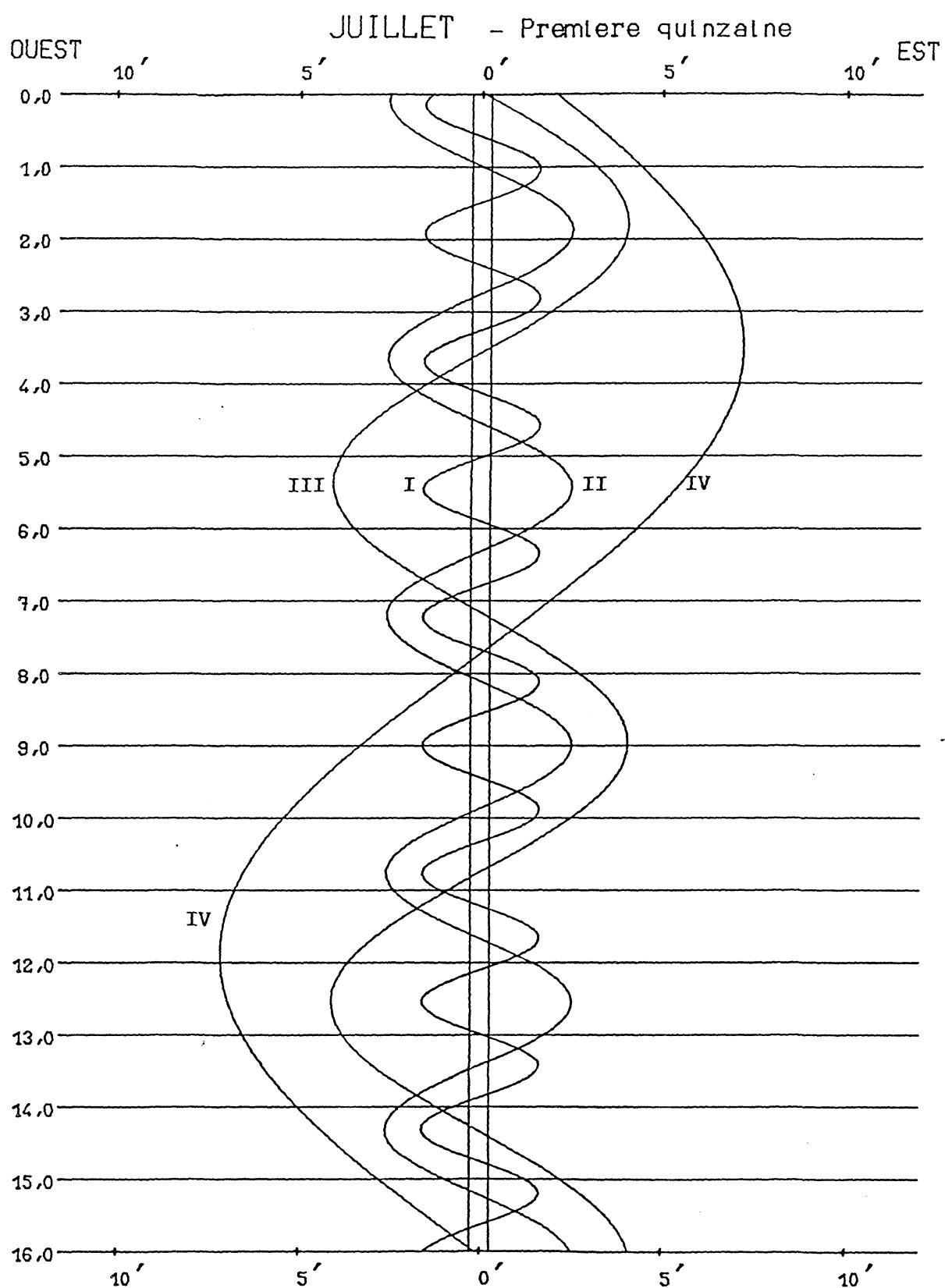


Dans le sens OUEST-EST, les satellites passent au-delà de Jupiter

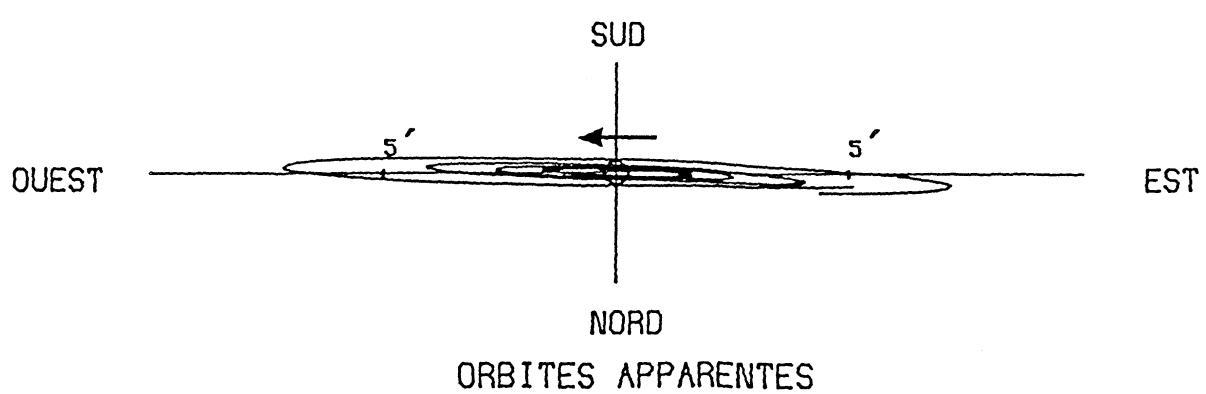


1989 - SATELLITES DE JUPITER -

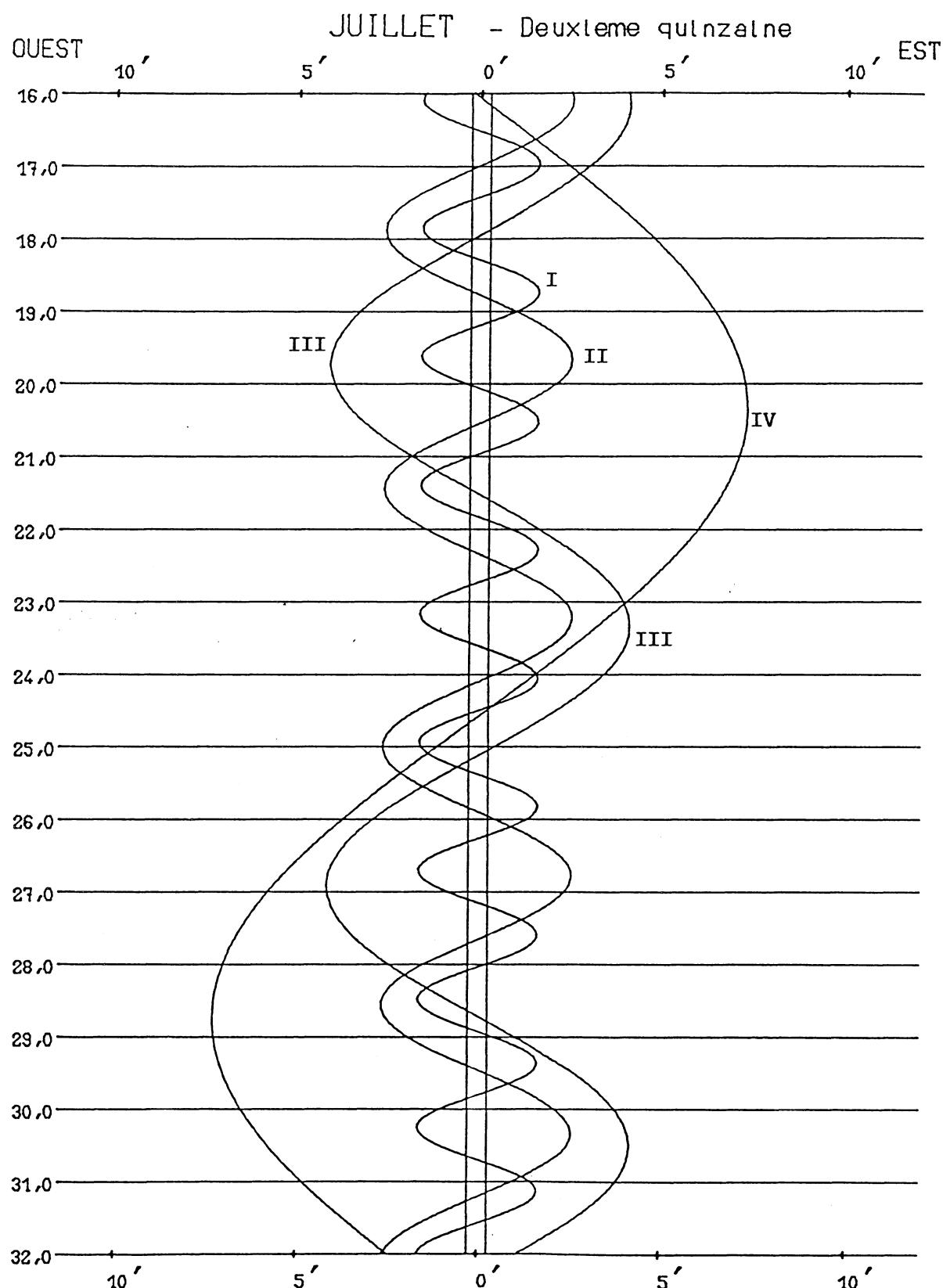
| PHENOMENES | | | | | | MOIS : JUILLET - PREMIERE QUINZAINE - | | | | | | | | | | | |
|------------|----|----|----|-----|----------|---------------------------------------|----|----|-----|----------|----------|------|----|----|-----|----------|----------|
| JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE |
| 1 | 1 | 9 | 0 | II | OC.F.INT | 6 | 15 | 9 | II | PA.D.EXT | | 19 | 40 | 59 | III | PA.F.EXT | |
| | 13 | 27 | | II | OC.F.EXT | 6 | 19 | 34 | II | PA.D.INT | | | | | I | EC.D.PEN | |
| 10 | 6 | 44 | | I | OM.D.EXT | 7 | 51 | 56 | II | OM.F.INT | 11 | 3 | 37 | 13 | I | EC.D.EXT | |
| 10 | 10 | 30 | | I | OM.D.INT | 7 | 56 | 24 | II | OM.F.EXT | | 3 | 38 | 0 | I | EC.D.INT | |
| 10 | 29 | 10 | | I | PA.D.EXT | 8 | 46 | 27 | II | PA.F.INT | | 3 | 41 | 46 | I | EC.D.INT | |
| 10 | 32 | 56 | | I | PA.D.INT | 8 | 50 | 51 | II | PA.F.EXT | | 6 | 22 | 1 | I | OC.F.INT | |
| 12 | 19 | 35 | | I | OM.F.INT | 17 | 32 | 31 | I | OM.D.EXT | | 6 | 25 | 46 | I | OC.F.EXT | |
| 12 | 23 | 21 | | I | OM.F.EXT | 17 | 36 | 17 | I | OM.D.INT | | 13 | 47 | 37 | II | EC.D.PEN | |
| 12 | 41 | 46 | | I | PA.F.INT | 18 | 0 | 6 | I | PA.D.EXT | | 13 | 49 | 22 | II | EC.D.EXT | |
| 12 | 45 | 31 | | I | PA.F.EXT | 18 | 3 | 52 | I | PA.D.INT | | 13 | 53 | 52 | II | EC.D.INT | |
| | | | | | | 19 | 45 | 20 | I | OM.F.INT | | 17 | 24 | 33 | II | OC.F.INT | |
| 2 | 7 | 14 | 27 | I | EC.D.PEN | 19 | 49 | 7 | I | OM.F.EXT | | 17 | 28 | 57 | II | OC.F.EXT | |
| | 15 | 14 | | I | EC.D.EXT | 20 | 12 | 41 | I | PA.F.INT | | | | | I | OM.D.EXT | |
| 7 | 19 | 0 | | I | EC.D.INT | 20 | 16 | 26 | I | PA.F.EXT | 12 | 0 | 58 | 20 | I | OM.D.INT | |
| 9 | 50 | 26 | | I | OC.F.INT | | | | | | | 1 | 2 | 6 | I | OM.D.INT | |
| 9 | 54 | 12 | | I | OC.F.EXT | 7 | 0 | 38 | 3 | III | EC.D.PEN | | 1 | 30 | 56 | I | PA.D.EXT |
| 16 | 3 | 45 | | II | OM.D.EXT | 0 | 42 | 15 | III | EC.D.EXT | | 1 | 34 | 41 | I | PA.D.INT | |
| 16 | 8 | 12 | | II | OM.D.INT | 0 | 54 | 17 | III | EC.D.INT | | 3 | 11 | 6 | I | OM.F.INT | |
| 16 | 50 | 36 | | II | PA.D.EXT | 5 | 12 | 59 | III | OC.F.INT | | 3 | 14 | 53 | I | OM.F.EXT | |
| 16 | 55 | 1 | | II | PA.D.INT | 5 | 24 | 27 | III | OC.F.EXT | | 3 | 43 | 29 | I | PA.F.INT | |
| 18 | 34 | 7 | | II | OM.F.INT | 14 | 40 | 8 | I | EC.D.PEN | | 3 | 47 | 14 | I | PA.F.EXT | |
| 18 | 38 | 35 | | II | OM.F.EXT | 14 | 40 | 54 | I | EC.D.EXT | | 22 | 5 | 44 | I | EC.D.PEN | |
| 19 | 21 | 36 | | II | PA.F.INT | 14 | 44 | 40 | I | EC.D.INT | | 22 | 6 | 30 | I | EC.D.EXT | |
| 19 | 26 | 1 | | II | PA.F.EXT | 17 | 21 | 26 | I | OC.F.INT | | 22 | 10 | 16 | I | EC.D.INT | |
| | | | | | | 17 | 25 | 12 | I | OC.F.EXT | | | | | | | |
| 3 | 4 | 35 | 18 | I | OM.D.EXT | | | | | | 13 | 0 | 52 | 15 | I | OC.F.INT | |
| 4 | 39 | 5 | | I | OM.D.INT | 8 | 0 | 29 | 29 | II | EC.D.PEN | | 0 | 56 | 0 | I | OC.F.EXT |
| 4 | 59 | 28 | | I | PA.D.EXT | 0 | 31 | 15 | II | EC.D.EXT | | 7 | 56 | 51 | II | OM.D.EXT | |
| 5 | 3 | 14 | | I | PA.D.INT | 0 | 35 | 45 | II | EC.D.INT | | 8 | 1 | 18 | II | OM.D.INT | |
| 6 | 48 | 9 | | I | OM.F.INT | 3 | 59 | 27 | II | OC.F.INT | | 9 | 4 | 14 | II | PA.D.EXT | |
| 6 | 51 | 55 | | I | OM.F.EXT | 4 | 3 | 52 | II | OC.F.EXT | | 9 | 8 | 38 | II | PA.D.INT | |
| 7 | 12 | 4 | | I | PA.F.INT | 12 | 1 | 10 | I | OM.D.EXT | | 10 | 27 | 51 | II | OM.F.INT | |
| 7 | 15 | 49 | | I | PA.F.EXT | 12 | 4 | 56 | I | OM.D.INT | | 10 | 32 | 17 | II | OM.F.EXT | |
| 10 | 42 | 5 | | III | OM.D.EXT | 12 | 30 | 27 | I | PA.D.EXT | | 11 | 36 | 10 | II | PA.F.INT | |
| 10 | 53 | 44 | | III | OM.D.INT | 12 | 34 | 12 | I | PA.D.INT | | 11 | 40 | 34 | II | PA.F.EXT | |
| 12 | 20 | 6 | | III | PA.D.EXT | 14 | 13 | 58 | I | OM.F.INT | | 19 | 26 | 53 | I | OM.D.INT | |
| 12 | 31 | 35 | | III | PA.D.INT | 14 | 17 | 45 | I | OM.F.EXT | | 19 | 30 | 39 | I | OM.D.INT | |
| 13 | 21 | 23 | | III | OM.F.INT | 14 | 43 | 0 | I | PA.F.INT | | 20 | 1 | 8 | I | PA.D.EXT | |
| 13 | 33 | 4 | | III | OM.F.EXT | 14 | 46 | 46 | I | PA.F.EXT | | 20 | 4 | 53 | I | PA.D.INT | |
| 15 | 0 | 49 | | III | PA.F.INT | | | | | | | 21 | 39 | 39 | I | OM.F.INT | |
| 15 | 12 | 17 | | III | PA.F.EXT | 9 | 9 | 8 | 38 | I | EC.D.PEN | | 21 | 43 | 25 | I | OM.F.EXT |
| | | | | | | 9 | 9 | 25 | I | EC.D.EXT | | 22 | 13 | 40 | I | PA.F.INT | |
| 4 | 1 | 43 | 3 | I | EC.D.PEN | 9 | 13 | 11 | I | EC.D.INT | | 22 | 17 | 25 | I | PA.F.EXT | |
| 1 | 43 | 49 | | I | EC.D.EXT | 11 | 51 | 41 | I | OC.F.INT | | | | | | | |
| 1 | 47 | 35 | | I | EC.D.INT | 11 | 55 | 27 | I | OC.F.EXT | 14 | 4 | 37 | 21 | III | EC.D.PEN | |
| 4 | 20 | 49 | | I | OC.F.INT | 18 | 39 | 13 | II | OM.D.EXT | | 4 | 41 | 32 | III | EC.D.EXT | |
| 4 | 24 | 34 | | I | OC.F.EXT | 18 | 43 | 40 | II | OM.D.INT | | 4 | 53 | 29 | III | EC.D.INT | |
| 11 | 11 | 40 | | II | EC.D.PEN | 19 | 39 | 52 | II | PA.D.EXT | | 9 | 41 | 16 | III | OC.F.INT | |
| 11 | 13 | 25 | | II | EC.D.EXT | 19 | 44 | 16 | II | PA.D.INT | | 9 | 52 | 38 | III | OC.F.EXT | |
| 11 | 17 | 56 | | II | EC.D.INT | 21 | 10 | 1 | II | OM.F.INT | | 16 | 34 | 17 | I | EC.D.PEN | |
| 14 | 34 | 28 | | II | OC.F.INT | 21 | 14 | 28 | II | OM.F.EXT | | 16 | 35 | 3 | I | EC.D.EXT | |
| 14 | 38 | 53 | | II | OC.F.EXT | 22 | 11 | 30 | II | PA.F.INT | | 16 | 38 | 49 | I | EC.D.INT | |
| 23 | 3 | 57 | | I | OM.D.EXT | 22 | 15 | 54 | II | PA.F.EXT | | 19 | 22 | 31 | I | OC.F.INT | |
| 23 | 7 | 43 | | I | OM.D.INT | | | | | | | 19 | 26 | 16 | I | OC.F.EXT | |
| 23 | 29 | 50 | | I | PA.D.EXT | 6 | 29 | 43 | I | OM.D.EXT | 15 | 3 | 5 | 19 | II | EC.D.PEN | |
| 23 | 33 | 35 | | I | PA.D.INT | 6 | 33 | 29 | I | OM.D.INT | | 3 | 7 | 4 | II | EC.D.EXT | |
| | | | | | | 7 | 0 | 40 | I | PA.D.EXT | | 3 | 11 | 33 | II | EC.D.INT | |
| 5 | 1 | 16 | 46 | I | OM.F.INT | 7 | 4 | 25 | I | PA.D.INT | | 6 | 49 | 10 | II | OC.F.INT | |
| 1 | 20 | 33 | | I | OM.F.EXT | 8 | 42 | 31 | I | OM.F.INT | | 6 | 53 | 34 | II | OC.F.EXT | |
| 1 | 42 | 24 | | I | PA.F.INT | 8 | 46 | 17 | I | OM.F.EXT | | 13 | 55 | 31 | I | OM.D.EXT | |
| 1 | 46 | 10 | | I | PA.F.EXT | 9 | 13 | 13 | I | PA.F.INT | | 13 | 59 | 17 | I | OM.D.INT | |
| 20 | 11 | 34 | | I | EC.D.PEN | 9 | 16 | 59 | I | PA.F.EXT | | 14 | 31 | 23 | I | PA.D.EXT | |
| 20 | 12 | 21 | | I | EC.D.EXT | 14 | 41 | 51 | III | OM.D.EXT | | 14 | 35 | 8 | I | PA.D.INT | |
| 20 | 16 | 7 | | I | EC.D.INT | 14 | 53 | 26 | III | OM.D.INT | | 16 | 8 | 15 | I | OM.F.INT | |
| 22 | 51 | 7 | | I | OC.F.INT | 16 | 47 | 50 | III | PA.D.EXT | | 16 | 12 | 1 | I | OM.F.EXT | |
| 22 | 54 | 52 | | I | OC.F.EXT | 16 | 59 | 13 | III | PA.D.INT | | 16 | 43 | 54 | I | PA.F.INT | |
| | | | | | | 17 | 22 | 0 | III | OM.F.INT | | 16 | 47 | 39 | I | PA.F.EXT | |
| 6 | 5 | 21 | 22 | II | OM.D.EXT | 17 | 33 | 37 | III | OM.F.EXT | | | | | | | |
| 5 | 25 | 49 | | II | OM.D.INT | 19 | 29 | 36 | III | PA.F.INT | | | | | | | |



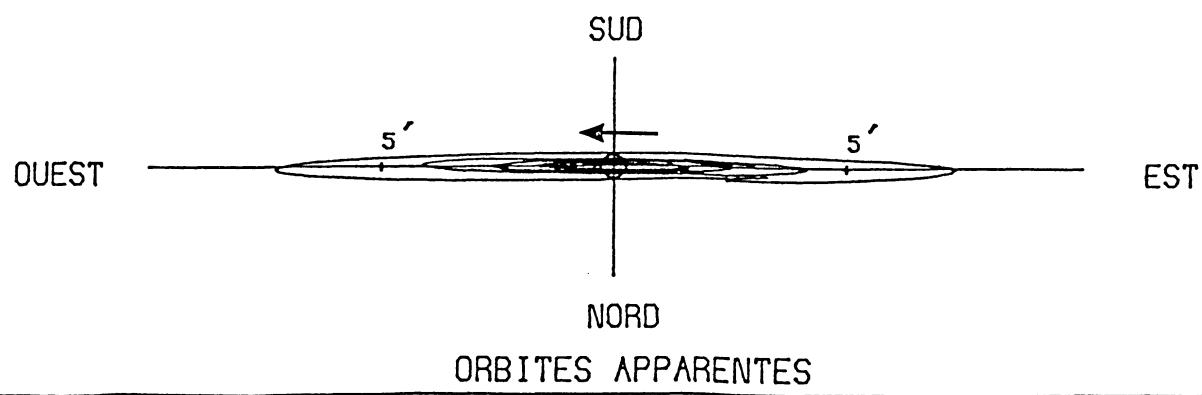
Dans le sens OUEST-EST, les satellites passent au-delà de Jupiter



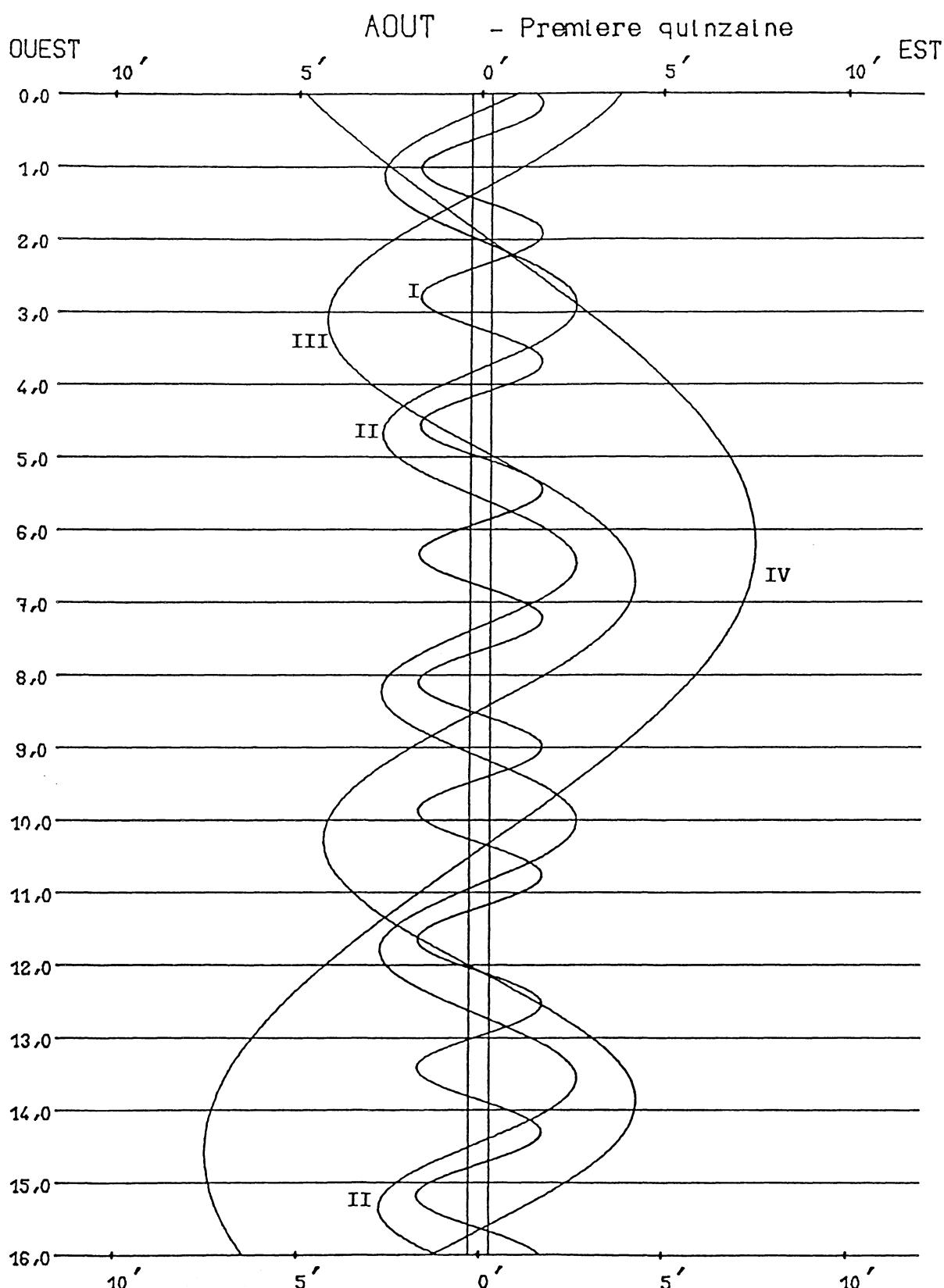
| PHENOMENES | | | | | | MOIS : | | JUILLET - DEUXIEME QUINZAINES - | | | | | | | | | | |
|------------|----|----|----|-----|----------|--------|----|---------------------------------|-----|----------|----------|------|----|----|-----|----------|----------|----------|
| JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE | |
| 16 | 11 | 2 | 46 | I | EC.D.PEN | 11 | 14 | 51 | III | EC.F.INT | | 7 | 48 | 12 | I | PA.F.EXT | | |
| | 11 | 3 | 33 | I | EC.D.EXT | 11 | 24 | 0 | III | OC.D.EXT | | | | | I | EC.D.PEN | | |
| | 11 | 7 | 19 | I | EC.D.INT | 11 | 26 | 44 | III | EC.F.EXT | 27 | 1 | 53 | 55 | I | EC.D.EXT | | |
| | 13 | 52 | 42 | I | OC.F.INT | 11 | 30 | 54 | III | EC.F.PEN | | 1 | 54 | 41 | I | EC.D.INT | | |
| | 13 | 56 | 27 | I | OC.F.EXT | 11 | 35 | 16 | III | OC.D.INT | | 1 | 58 | 28 | I | EC.F.INT | | |
| | 21 | 14 | 48 | II | OM.D.EXT | 14 | 8 | 34 | III | OC.F.INT | | 4 | 53 | 40 | I | OC.F.INT | | |
| | 21 | 19 | 14 | II | OM.D.INT | 14 | 19 | 51 | III | OC.F.EXT | | 4 | 57 | 25 | I | OC.F.EXT | | |
| | 22 | 28 | 50 | II | PA.D.EXT | 18 | 28 | 23 | I | EC.D.PEN | | 13 | 8 | 7 | II | OM.D.EXT | | |
| | 22 | 33 | 13 | II | PA.D.INT | 18 | 29 | 9 | I | EC.D.EXT | | 13 | 12 | 33 | II | OM.D.INT | | |
| | 23 | 46 | 0 | II | OM.F.INT | 18 | 32 | 56 | I | EC.D.INT | | 14 | 41 | 13 | II | PA.D.EXT | | |
| | 23 | 50 | 27 | II | OM.F.EXT | 21 | 23 | 18 | I | OC.F.INT | | 14 | 45 | 36 | II | PA.D.INT | | |
| | | | | | | 21 | 27 | 3 | I | OC.F.EXT | | 15 | 39 | 53 | II | OM.F.INT | | |
| 17 | 1 | 1 | 6 | II | PA.F.INT | | | | | | | 15 | 44 | 19 | II | OM.F.EXT | | |
| | 1 | 5 | 29 | II | PA.F.EXT | 22 | 5 | 40 | 53 | II | EC.D.PEN | | 17 | 14 | 24 | II | PA.F.INT | |
| | 8 | 24 | 2 | I | OM.D.EXT | | 5 | 42 | 37 | II | EC.D.EXT | | 17 | 18 | 46 | II | PA.F.EXT | |
| | 8 | 27 | 48 | I | OM.D.INT | | 5 | 47 | 5 | II | EC.D.INT | | 23 | 15 | 19 | I | OM.D.EXT | |
| | 9 | 1 | 31 | I | PA.D.EXT | | 9 | 38 | 3 | II | OC.F.INT | | 23 | 19 | 4 | I | OM.D.INT | |
| | 9 | 5 | 16 | I | PA.D.INT | | 9 | 42 | 25 | II | OC.F.EXT | | | | | | | |
| | 10 | 36 | 46 | I | OM.F.INT | | 15 | 49 | 45 | I | OM.D.EXT | 28 | 0 | 2 | 1 | I | PA.D.EXT | |
| | 10 | 40 | 32 | I | OM.F.EXT | | 15 | 53 | 31 | I | OM.D.INT | | 0 | 5 | 46 | I | PA.D.INT | |
| | 11 | 14 | 2 | I | PA.F.INT | | 16 | 31 | 56 | I | PA.D.EXT | | 1 | 27 | 56 | I | OM.F.INT | |
| | 11 | 17 | 47 | I | PA.F.EXT | | 16 | 35 | 40 | I | PA.D.INT | | 1 | 31 | 41 | I | OM.F.EXT | |
| | 18 | 41 | 54 | III | OM.D.EXT | | 18 | 2 | 25 | I | OM.F.INT | | 2 | 14 | 26 | I | PA.F.INT | |
| | 18 | 53 | 23 | III | OM.D.INT | | 18 | 6 | 11 | I | OM.F.EXT | | 2 | 18 | 11 | I | PA.F.EXT | |
| | 21 | 14 | 49 | III | PA.D.EXT | | 18 | 44 | 24 | I | PA.F.INT | | 12 | 36 | 53 | III | EC.D.PEN | |
| | 21 | 22 | 53 | III | OM.F.INT | | 18 | 48 | 8 | I | PA.F.EXT | | 12 | 41 | 1 | III | EC.D.EXT | |
| | 21 | 26 | 6 | III | PA.D.INT | | | | | | | 12 | 52 | 49 | III | EC.D.INT | | |
| | 21 | 34 | 26 | III | OM.F.EXT | 23 | 12 | 56 | 52 | I | EC.D.PEN | | 15 | 16 | 2 | III | EC.F.INT | |
| | 23 | 57 | 38 | III | PA.F.INT | | 12 | 57 | 38 | I | EC.D.EXT | | 15 | 27 | 50 | III | EC.F.EXT | |
| | | | | | | | 13 | 1 | 24 | I | EC.D.INT | | 15 | 31 | 58 | III | EC.F.PEN | |
| 18 | 0 | 8 | 54 | III | PA.F.EXT | | 15 | 53 | 24 | I | OC.F.INT | | 15 | 49 | 42 | III | OC.D.EXT | |
| | 5 | 31 | 21 | I | EC.D.PEN | | 15 | 57 | 10 | I | OC.F.EXT | | 16 | 0 | 53 | III | OC.D.INT | |
| | 5 | 32 | 7 | I | EC.D.EXT | | 23 | 50 | 26 | II | OM.D.EXT | | 18 | 35 | 29 | III | OC.F.INT | |
| | 5 | 35 | 53 | I | EC.D.INT | | 23 | 54 | 52 | II | OM.D.INT | | 18 | 46 | 41 | III | OC.F.EXT | |
| | 8 | 22 | 57 | I | OC.F.INT | | | | | | | 20 | 22 | 27 | I | EC.D.PEN | | |
| | 8 | 26 | 42 | I | OC.F.EXT | 24 | 1 | 17 | 21 | II | PA.D.EXT | | 20 | 23 | 13 | I | EC.D.EXT | |
| | 16 | 23 | 17 | II | EC.D.PEN | | 1 | 21 | 44 | II | PA.D.INT | | 20 | 26 | 59 | I | EC.D.INT | |
| | 16 | 25 | 1 | II | EC.D.EXT | | 2 | 22 | 2 | II | OM.F.INT | | 23 | 23 | 46 | I | OC.F.INT | |
| | 16 | 29 | 30 | II | EC.D.INT | | 2 | 26 | 29 | II | OM.F.EXT | | 23 | 27 | 31 | I | OC.F.EXT | |
| | 20 | 13 | 50 | II | OC.F.INT | | 3 | 50 | 15 | II | PA.F.INT | | | | | | | |
| | 20 | 18 | 12 | II | OC.F.EXT | | 3 | 54 | 37 | II | PA.F.EXT | 29 | 8 | 16 | 14 | II | EC.D.PEN | |
| | | | | | | | 10 | 18 | 15 | I | OM.D.EXT | | 8 | 17 | 58 | II | EC.D.EXT | |
| 19 | 2 | 52 | 37 | I | OM.D.EXT | | 10 | 22 | 1 | I | OM.D.INT | | 8 | 22 | 25 | II | EC.D.INT | |
| | 2 | 56 | 23 | I | OM.D.INT | | 11 | 1 | 58 | I | PA.D.EXT | | 12 | 26 | 4 | II | OC.F.INT | |
| | 3 | 31 | 41 | I | PA.D.EXT | | 11 | 5 | 43 | I | PA.D.INT | | 12 | 30 | 24 | II | OC.F.EXT | |
| | 3 | 35 | 26 | I | PA.D.INT | | 12 | 30 | 55 | I | OM.F.INT | | 17 | 43 | 53 | I | OM.D.INT | |
| | 5 | 5 | 20 | I | OM.F.INT | | 12 | 34 | 40 | I | OM.F.EXT | | 17 | 47 | 39 | I | OM.D.INT | |
| | 5 | 9 | 6 | I | OM.F.EXT | | 13 | 14 | 25 | I | PA.F.INT | | 18 | 32 | 3 | I | PA.D.EXT | |
| | 5 | 44 | 11 | I | PA.F.INT | | 13 | 18 | 10 | I | PA.F.EXT | | 18 | 35 | 47 | I | PA.D.INT | |
| | 5 | 47 | 56 | I | PA.F.EXT | | 22 | 41 | 4 | III | OM.D.EXT | | 19 | 56 | 29 | I | OM.F.INT | |
| | 23 | 59 | 50 | I | EC.D.PEN | | 22 | 52 | 29 | III | OM.D.INT | | 20 | 0 | 14 | I | OM.F.EXT | |
| | | | | | | | | | | | | 20 | 44 | 27 | I | PA.F.EXT | | |
| 20 | 0 | 0 | 37 | I | EC.D.EXT | 25 | 1 | 22 | 53 | III | OM.F.INT | | | | | | | |
| | 0 | 4 | 23 | I | EC.D.INT | | 1 | 34 | 21 | III | OM.F.EXT | | 30 | 14 | 50 | 55 | I | EC.D.PEN |
| | 2 | 53 | 7 | I | OC.F.INT | | 1 | 39 | 46 | III | PA.D.EXT | | 14 | 51 | 41 | I | EC.D.EXT | |
| | 2 | 56 | 52 | I | OC.F.EXT | | 1 | 50 | 58 | III | PA.D.INT | | 14 | 55 | 27 | I | EC.D.INT | |
| | 10 | 32 | 28 | II | OM.D.EXT | | 4 | 23 | 39 | III | PA.F.INT | | 17 | 53 | 47 | I | OC.F.INT | |
| | 10 | 36 | 54 | II | OM.D.INT | | 4 | 34 | 49 | III | PA.F.EXT | | 17 | 57 | 32 | I | OC.F.EXT | |
| | 11 | 52 | 59 | II | PA.D.EXT | | 7 | 25 | 26 | I | EC.D.PEN | | | | | | | |
| | 11 | 57 | 22 | II | PA.D.INT | | 7 | 26 | 12 | I | EC.D.EXT | | | | | | | |
| | 13 | 3 | 51 | II | OM.F.INT | | 7 | 29 | 58 | I | EC.D.INT | 31 | 2 | 26 | 10 | II | OM.D.EXT | |
| | 13 | 8 | 18 | II | OM.F.EXT | | 10 | 23 | 35 | I | OC.F.INT | | 2 | 30 | 35 | II | OM.D.INT | |
| | 14 | 25 | 33 | II | PA.F.INT | | 10 | 27 | 20 | I | OC.F.EXT | | 4 | 5 | 21 | II | PA.D.EXT | |
| | 14 | 29 | 56 | II | PA.F.EXT | | 18 | 58 | 43 | II | EC.D.PEN | | 4 | 9 | 43 | II | PA.D.INT | |
| | 21 | 21 | 9 | I | OM.D.EXT | | 19 | 0 | 27 | II | EC.D.INT | | 4 | 58 | 9 | II | OM.F.INT | |
| | 21 | 24 | 55 | I | OM.D.INT | | 19 | 4 | 55 | II | EC.D.EXT | | 5 | 2 | 35 | II | OM.F.EXT | |
| | 22 | 1 | 47 | I | PA.D.EXT | | 23 | 2 | 16 | II | OC.F.INT | | 6 | 38 | 51 | II | PA.F.INT | |
| | 22 | 5 | 32 | I | PA.D.INT | | 23 | 6 | 37 | II | OC.F.EXT | | 6 | 43 | 12 | II | PA.F.EXT | |
| | 23 | 33 | 51 | I | OM.F.INT | | | | | | | 12 | 12 | 23 | I | OM.D.EXT | | |
| | 23 | 37 | 36 | I | OM.F.EXT | 26 | 4 | 46 | 49 | I | OM.D.EXT | | 12 | 16 | 8 | I | OM.D.INT | |
| | | | | | | | 4 | 50 | 34 | I | OM.D.INT | | 13 | 1 | 59 | I | PA.D.EXT | |
| 21 | 0 | 14 | 16 | I | PA.F.INT | | 5 | 32 | 2 | I | PA.D.EXT | | 13 | 5 | 43 | I | PA.D.INT | |
| | 0 | 18 | 1 | I | PA.F.EXT | | 5 | 35 | 46 | I | PA.D.INT | | 14 | 24 | 57 | I | OM.F.INT | |
| | 8 | 36 | 43 | III | EC.D.PEN | | 6 | 59 | 27 | I | OM.F.INT | | 14 | 28 | 42 | I | OM.F.EXT | |
| | 8 | 40 | 52 | III | EC.D.EXT | | 7 | 3 | 12 | I | OM.F.EXT | | 15 | 14 | 22 | I | PA.F.INT | |
| | 8 | 52 | 45 | III | EC.D.INT | | 7 | 44 | 28 | I | PA.F.INT | | 15 | 18 | 6 | I | PA.F.EXT | |



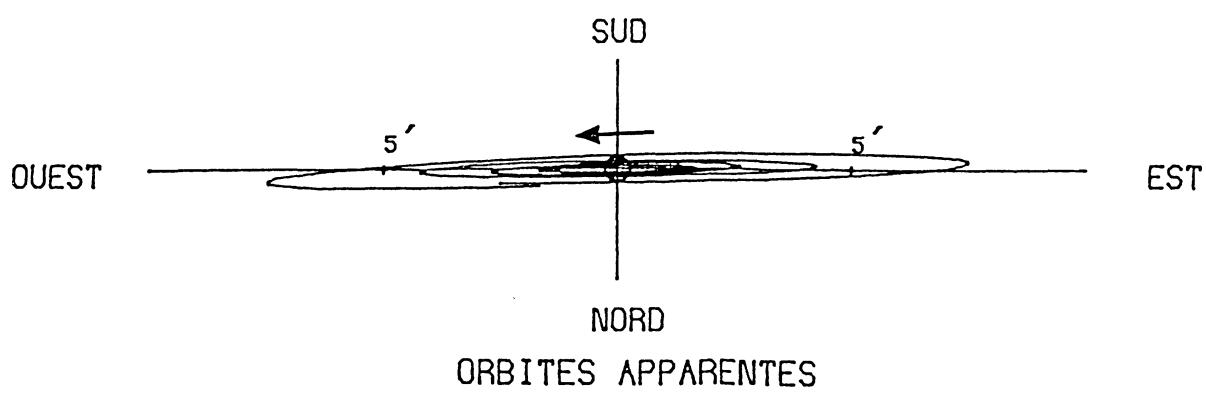
Dans le sens OUEST-EST, les satellites passent au-delà de Jupiter



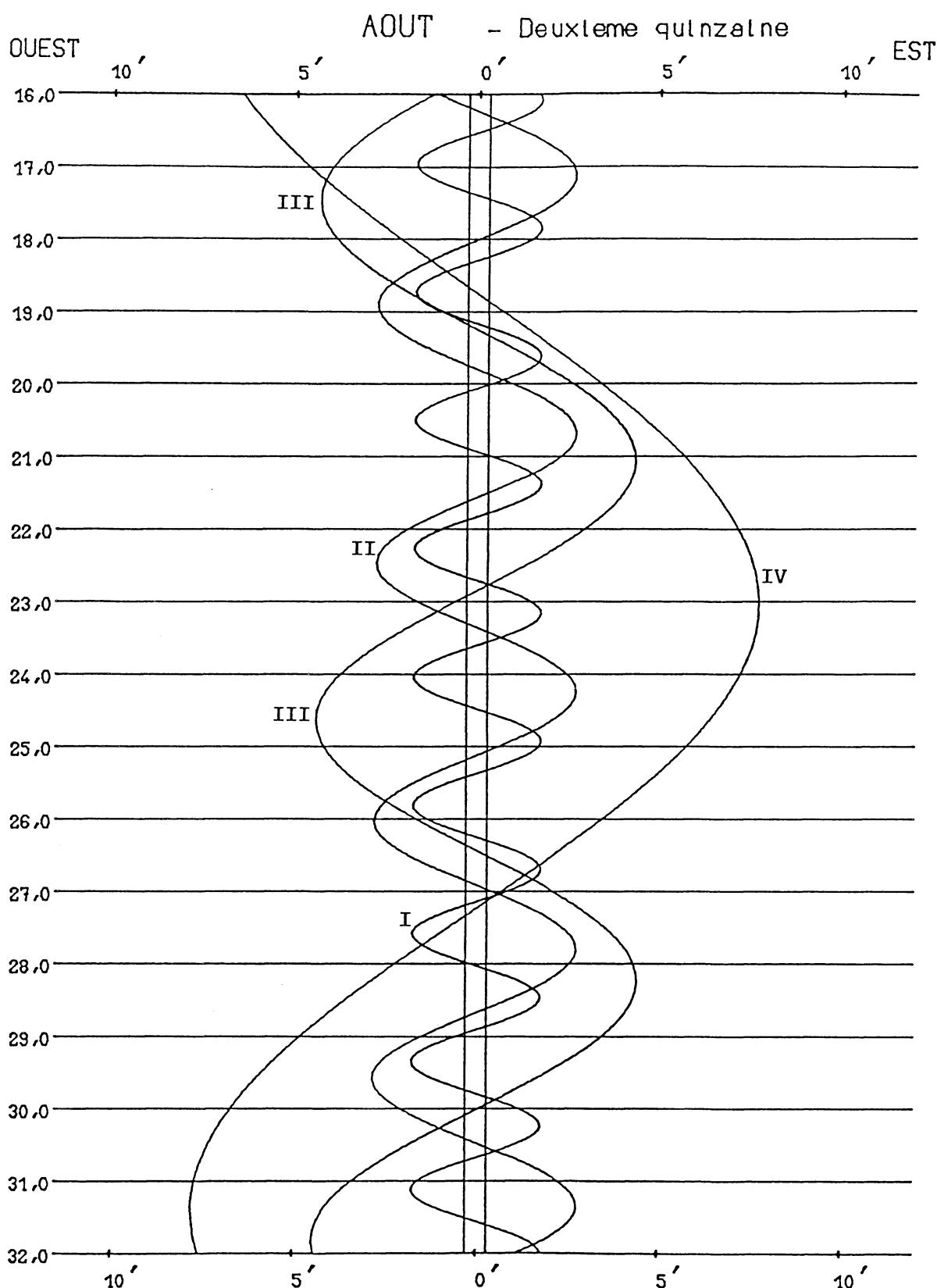
| PHENOMENES | | | | | | MOIS : | | | AOUT - PREMIERE QUINZAINE - | | | | | | | | | |
|------------|----|----|----|-----|----------|----------|----|----|-----------------------------|----------|----------|----------|----|-----|----------|----------|----------|----------|
| JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE | |
| 1 | 2 | 39 | 58 | III | OM.D.EXT | 20 | 31 | 42 | I | PA.D.EXT | 3 | 7 | 6 | I | OM.D.INT | | | |
| | 2 | 51 | 18 | III | OM.D.INT | 20 | 35 | 26 | I | PA.D.INT | 4 | 1 | 2 | I | PA.D.EXT | | | |
| | 5 | 22 | 36 | III | OM.F.INT | 21 | 50 | 26 | I | OM.F.INT | 4 | 4 | 46 | I | PA.D.INT | | | |
| | 5 | 34 | 0 | III | OM.F.EXT | 21 | 54 | 11 | I | OM.F.EXT | 5 | 15 | 47 | I | OM.F.INT | | | |
| | 6 | 3 | 6 | III | PA.D.EXT | 22 | 44 | 2 | I | PA.F.INT | 5 | 19 | 32 | I | OM.F.EXT | | | |
| | 6 | 14 | 13 | III | PA.D.INT | 22 | 47 | 46 | I | PA.F.EXT | 6 | 13 | 19 | I | PA.F.INT | | | |
| | 8 | 48 | 2 | III | PA.F.INT | | | | | | 6 | 17 | 3 | I | PA.F.EXT | | | |
| | 8 | 59 | 7 | III | PA.F.EXT | 6 | 16 | 44 | 56 | I | EC.D.PEN | 20 | 35 | 58 | III | EC.D.PEN | | |
| | 9 | 19 | 28 | I | EC.D.PEN | | | | I | EC.D.EXT | 20 | 40 | 2 | III | EC.D.EXT | | | |
| | 9 | 20 | 15 | I | EC.D.EXT | | | | I | EC.D.INT | 20 | 51 | 40 | III | EC.D.INT | | | |
| | 9 | 24 | 1 | I | EC.D.INT | | | | I | OC.F.INT | 23 | 17 | 6 | III | EC.F.INT | | | |
| | 12 | 23 | 52 | I | OC.F.INT | | | | I | OC.F.EXT | 23 | 28 | 44 | III | EC.F.EXT | | | |
| | 12 | 27 | 37 | I | OC.F.EXT | | | | I | OC.F.PEN | 23 | 32 | 49 | III | EC.F.PEN | | | |
| | 21 | 33 | 54 | II | EC.D.PEN | 7 | 5 | 1 | 59 | II | OM.D.EXT | | | | | | | |
| | 21 | 35 | 37 | II | EC.D.EXT | | 5 | 6 | 24 | II | OM.D.INT | 12 | 0 | 10 | 28 | I | EC.D.PEN | |
| | 21 | 40 | 3 | II | EC.D.INT | | 6 | 52 | 44 | II | PA.D.EXT | | 0 | 11 | 14 | I | EC.D.EXT | |
| | 2 | 1 | 49 | 43 | II | OC.F.INT | | 6 | 57 | 5 | II | PA.D.INT | | 0 | 15 | 0 | I | EC.D.INT |
| | 1 | 54 | 2 | II | OC.F.EXT | | 7 | 34 | 21 | II | OM.F.INT | | 0 | 34 | 55 | III | OC.D.EXT | |
| | 6 | 40 | 54 | I | OM.D.EXT | | 9 | 26 | 49 | II | PA.F.INT | | 0 | 45 | 55 | III | OC.D.INT | |
| | 6 | 44 | 39 | I | OM.D.INT | | 9 | 31 | 9 | II | PA.F.EXT | | 3 | 23 | 8 | III | OC.F.INT | |
| | 7 | 31 | 55 | I | PA.D.EXT | | 14 | 6 | 24 | I | OM.D.EXT | | 3 | 23 | 28 | I | OC.F.INT | |
| | 7 | 35 | 39 | I | PA.D.INT | | 14 | 10 | 9 | I | OM.D.INT | | 3 | 27 | 13 | I | OC.F.EXT | |
| | 8 | 53 | 27 | I | OM.F.INT | | 15 | 1 | 30 | I | PA.D.EXT | | 3 | 34 | 8 | III | OC.F.EXT | |
| | 8 | 57 | 12 | I | OM.F.EXT | | 15 | 5 | 14 | I | PA.D.INT | | 13 | 26 | 12 | II | EC.D.PEN | |
| | 9 | 44 | 17 | I | PA.F.INT | | 16 | 18 | 52 | I | OM.F.INT | | 13 | 27 | 54 | II | EC.D.EXT | |
| | 9 | 48 | 1 | I | PA.F.EXT | | 16 | 22 | 37 | I | OM.F.EXT | | 13 | 32 | 19 | II | EC.D.INT | |
| | 3 | 3 | 47 | 57 | I | EC.D.PEN | | 17 | 13 | 49 | I | PA.F.INT | | 17 | 58 | 52 | II | OC.F.INT |
| | 3 | 48 | 43 | I | EC.D.EXT | | 17 | 17 | 33 | I | PA.F.EXT | | 18 | 3 | 9 | II | OC.F.EXT | |
| | 3 | 52 | 29 | I | EC.D.INT | 8 | 6 | 39 | 1 | III | OM.D.EXT | | 21 | 31 | 52 | I | OM.D.EXT | |
| | 6 | 53 | 50 | I | OC.F.INT | | 6 | 50 | 16 | III | OM.D.INT | | 21 | 35 | 37 | I | OM.D.INT | |
| | 6 | 57 | 35 | I | OC.F.EXT | | 9 | 22 | 28 | III | OM.F.INT | | 22 | 30 | 48 | I | PA.D.EXT | |
| | 15 | 43 | 53 | II | OM.D.EXT | | 9 | 33 | 47 | III | OM.F.EXT | | 22 | 34 | 32 | I | PA.D.INT | |
| | 15 | 48 | 18 | II | OM.D.INT | | 10 | 25 | 3 | III | PA.D.EXT | | 23 | 44 | 16 | I | OM.F.INT | |
| | 17 | 28 | 55 | II | PA.D.EXT | | 10 | 36 | 4 | III | PA.D.INT | | 23 | 48 | 1 | I | OM.F.EXT | |
| | 17 | 33 | 17 | II | PA.D.INT | | 11 | 13 | 29 | I | EC.D.PEN | 13 | 0 | 43 | 4 | I | PA.F.INT | |
| | 18 | 16 | 2 | II | OM.F.INT | | 11 | 14 | 15 | I | EC.D.EXT | | 0 | 46 | 47 | I | PA.F.EXT | |
| | 18 | 20 | 28 | II | OM.F.EXT | | 11 | 18 | 1 | I | EC.D.INT | | 18 | 38 | 55 | I | EC.D.PEN | |
| | 20 | 2 | 41 | II | PA.F.INT | | 13 | 11 | 1 | III | PA.F.EXT | | 18 | 39 | 41 | I | EC.D.EXT | |
| | 20 | 7 | 2 | II | PA.F.EXT | | 13 | 22 | 0 | III | PA.F.INT | | 18 | 43 | 27 | I | EC.D.INT | |
| | 4 | 1 | 9 | 23 | I | OM.D.EXT | | 14 | 23 | 43 | I | OC.F.INT | | 21 | 53 | 15 | I | OC.F.INT |
| | 1 | 13 | 8 | I | OM.D.INT | | 14 | 27 | 28 | I | OC.F.EXT | | 21 | 56 | 59 | I | OC.F.EXT | |
| | 2 | 1 | 47 | I | PA.D.EXT | 9 | 0 | 8 | 50 | II | EC.D.PEN | 14 | 7 | 37 | 52 | II | OM.D.EXT | |
| | 2 | 5 | 32 | I | PA.D.INT | | 0 | 10 | 33 | II | EC.D.EXT | | 7 | 42 | 16 | II | OM.D.INT | |
| | 3 | 21 | 54 | I | OM.F.INT | | 0 | 14 | 58 | II | EC.D.INT | | 9 | 39 | 19 | II | PA.D.EXT | |
| | 3 | 25 | 40 | I | OM.F.EXT | | 4 | 36 | 5 | II | OC.F.INT | | 9 | 43 | 39 | II | PA.D.INT | |
| | 4 | 14 | 9 | I | PA.F.INT | | 4 | 40 | 23 | II | OC.F.EXT | | 10 | 10 | 36 | II | OM.F.INT | |
| | 4 | 17 | 53 | I | PA.F.EXT | | 8 | 34 | 54 | I | OM.D.EXT | | 10 | 15 | 1 | II | OM.F.EXT | |
| | 16 | 36 | 19 | III | EC.D.PEN | | 8 | 38 | 38 | I | OM.D.INT | | 12 | 13 | 56 | II | PA.F.INT | |
| | 16 | 40 | 26 | III | EC.D.EXT | | 9 | 31 | 18 | I | PA.D.EXT | | 12 | 18 | 16 | II | PA.F.EXT | |
| | 16 | 52 | 9 | III | EC.D.INT | | 9 | 35 | 2 | I | PA.D.INT | | 16 | 0 | 19 | I | OM.D.EXT | |
| | 19 | 16 | 28 | III | EC.F.INT | | 10 | 47 | 21 | I | OM.F.INT | | 16 | 4 | 3 | I | OM.D.INT | |
| | 19 | 28 | 11 | III | EC.F.EXT | | 10 | 51 | 6 | I | OM.F.EXT | | 17 | 0 | 28 | I | PA.D.EXT | |
| | 19 | 32 | 18 | III | EC.F.PEN | | 11 | 43 | 36 | I | PA.F.INT | | 17 | 4 | 11 | I | PA.D.INT | |
| | 20 | 13 | 7 | III | OC.D.EXT | | 11 | 47 | 20 | I | PA.F.EXT | | 18 | 12 | 42 | I | OM.F.INT | |
| | 20 | 24 | 13 | III | OC.D.INT | | | | | | | | 18 | 16 | 27 | I | OM.F.EXT | |
| | 22 | 16 | 28 | I | EC.D.PEN | 10 | 5 | 41 | 57 | I | EC.D.PEN | | 19 | 12 | 43 | I | PA.F.INT | |
| | 22 | 17 | 15 | I | EC.D.EXT | | 5 | 42 | 43 | I | EC.D.EXT | | 19 | 16 | 26 | I | PA.F.EXT | |
| | 22 | 21 | 1 | I | EC.D.INT | | 5 | 46 | 29 | I | EC.D.INT | 15 | 10 | 38 | 6 | III | OM.D.EXT | |
| | 23 | 0 | 8 | III | OC.F.INT | | 8 | 53 | 35 | I | OC.F.INT | | 10 | 49 | 17 | III | OM.D.INT | |
| | 23 | 11 | 14 | III | OC.F.EXT | | 8 | 57 | 19 | I | OC.F.EXT | | 13 | 7 | 27 | I | EC.D.PEN | |
| | 5 | 1 | 23 | 51 | I | OC.F.INT | | 18 | 19 | 41 | II | OM.D.EXT | | 13 | 8 | 14 | I | EC.D.EXT |
| | 1 | 27 | 36 | I | OC.F.EXT | | 18 | 24 | 6 | II | OM.D.INT | | 13 | 11 | 59 | I | EC.D.INT | |
| | 10 | 51 | 19 | II | EC.D.PEN | | 20 | 15 | 52 | II | PA.D.EXT | | 13 | 22 | 22 | III | OM.F.INT | |
| | 10 | 53 | 2 | II | EC.D.EXT | | 20 | 20 | 12 | II | PA.D.INT | | 13 | 33 | 37 | III | OM.F.EXT | |
| | 10 | 57 | 28 | II | EC.D.INT | | 20 | 52 | 13 | II | OM.F.INT | | 14 | 45 | 9 | III | PA.D.EXT | |
| | 15 | 13 | 1 | II | OC.F.INT | | 20 | 56 | 38 | II | OM.F.EXT | | 14 | 56 | 5 | III | PA.D.INT | |
| | 15 | 17 | 19 | II | OC.F.EXT | | 22 | 50 | 12 | II | PA.F.INT | | 16 | 23 | 6 | I | OC.F.INT | |
| | 19 | 37 | 56 | I | OM.D.EXT | | 22 | 54 | 32 | II | PA.F.EXT | | 16 | 26 | 50 | I | OC.F.EXT | |
| | 19 | 41 | 41 | I | OM.D.INT | 11 | 3 | 3 | 21 | I | OM.D.EXT | | 17 | 32 | 9 | III | PA.F.INT | |
| | | | | | | | | | | | | | 17 | 43 | 2 | III | PA.F.EXT | |



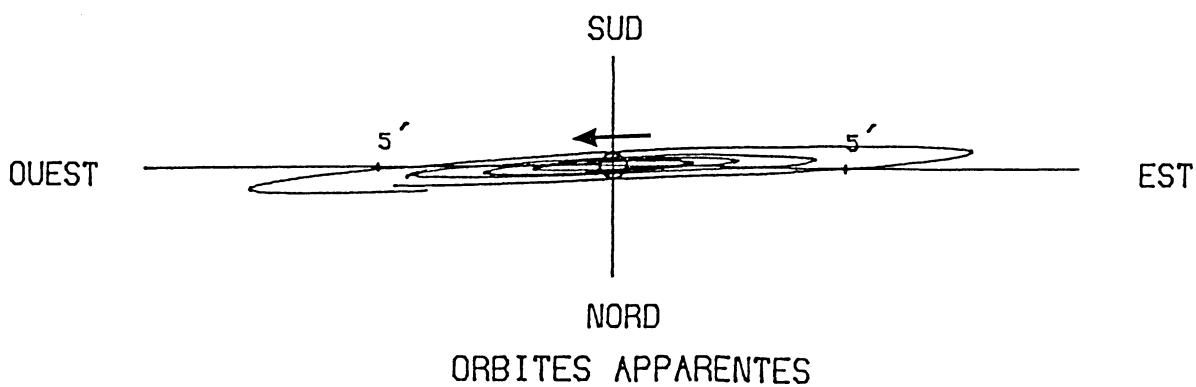
Dans le sens OUEST-EST, les satellites passent au-delà de Jupiter



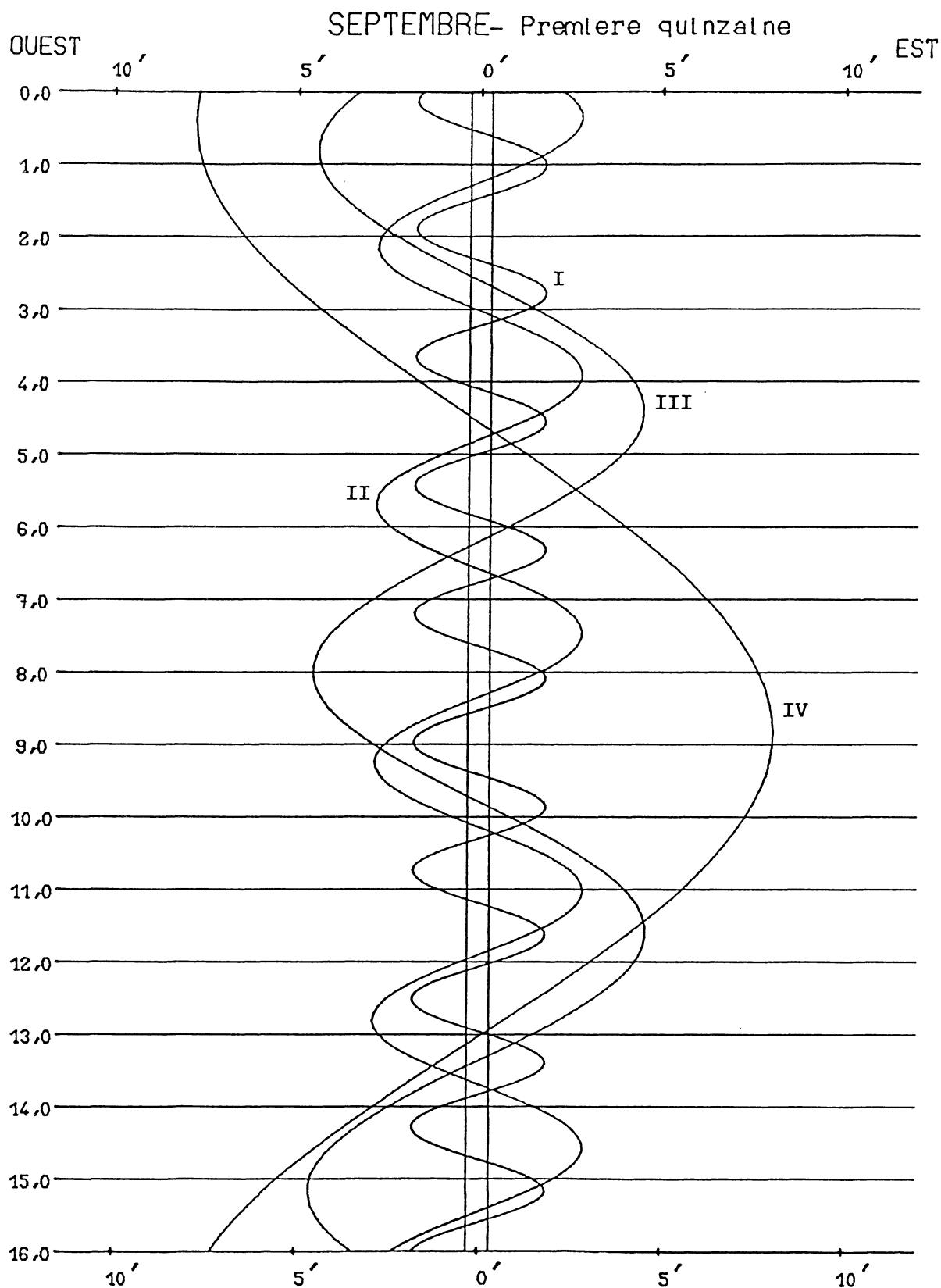
| PHENOMENES | | | | | | MOIS : | | | AOUT - DEUXIEME QUINZAINE - | | | | | | | | |
|------------|----|----|----|-----|----------|--------|----|----|-----------------------------|----------|----------|------|----|-----|----------|----------|----------|
| JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE |
| 16 | 2 | 43 | 34 | II | EC.D.PEN | 12 | 29 | 20 | II | PA.D.INT | 7 | 32 | 16 | III | EC.F.PEN | | |
| | 2 | 45 | 16 | II | EC.D.EXT | 12 | 46 | 58 | II | OM.F.INT | 9 | 10 | 47 | III | OC.D.EXT | | |
| | 2 | 49 | 40 | II | EC.D.INT | 12 | 51 | 22 | II | OM.F.EXT | 9 | 21 | 37 | III | OC.D.INT | | |
| | 7 | 21 | 19 | II | OC.F.INT | 15 | 0 | 10 | II | PA.F.INT | 12 | 1 | 21 | III | OC.F.INT | | |
| | 7 | 25 | 35 | II | OC.F.EXT | 15 | 4 | 28 | II | PA.F.EXT | 12 | 12 | 11 | III | OC.F.EXT | | |
| | 10 | 28 | 47 | I | OM.D.EXT | 17 | 54 | 8 | I | OM.D.EXT | 18 | 35 | 15 | II | EC.D.PEN | | |
| | 10 | 32 | 32 | I | OM.D.INT | 17 | 57 | 52 | I | OM.D.INT | 18 | 36 | 56 | II | EC.D.EXT | | |
| | 11 | 30 | 7 | I | PA.D.EXT | 18 | 58 | 50 | I | PA.D.EXT | 18 | 41 | 18 | II | EC.D.INT | | |
| | 11 | 33 | 51 | I | PA.D.INT | 19 | 2 | 33 | I | PA.D.INT | 23 | 26 | 43 | II | OC.F.INT | | |
| | 12 | 41 | 9 | I | OM.F.INT | 20 | 6 | 26 | I | OM.F.INT | 23 | 30 | 58 | II | OC.F.EXT | | |
| | 12 | 44 | 54 | I | OM.F.EXT | 20 | 10 | 11 | I | OM.F.EXT | | | | | | | |
| | 13 | 42 | 21 | I | PA.F.INT | 21 | 11 | 1 | I | PA.F.INT | 27 | 1 | 19 | 28 | I | OM.D.EXT | |
| | 13 | 46 | 4 | I | PA.F.EXT | 21 | 14 | 44 | I | PA.F.EXT | 1 | 23 | 12 | I | OM.D.INT | | |
| | | | | | | | | | | | 2 | 27 | 12 | I | PA.D.EXT | | |
| 17 | 7 | 35 | 55 | I | EC.D.PEN | 22 | 14 | 37 | 55 | III | OM.D.EXT | 2 | 30 | 55 | I | PA.D.INT | |
| | 7 | 36 | 41 | I | EC.D.EXT | | 14 | 49 | 1 | III | OM.D.INT | 3 | 31 | 42 | I | OM.F.INT | |
| | 7 | 40 | 27 | I | EC.D.INT | | 15 | 1 | 24 | I | EC.D.PEN | 3 | 35 | 26 | I | OM.F.EXT | |
| | 10 | 52 | 49 | I | OC.F.INT | | 15 | 2 | 10 | I | EC.D.EXT | 4 | 39 | 20 | I | PA.F.INT | |
| | 10 | 56 | 34 | I | OC.F.EXT | | 15 | 5 | 56 | I | EC.D.INT | 4 | 43 | 3 | I | PA.F.EXT | |
| | 20 | 55 | 35 | II | OM.D.EXT | | 17 | 23 | 0 | III | OM.F.INT | 22 | 26 | 47 | I | EC.D.PEN | |
| | 20 | 59 | 59 | II | OM.D.INT | | 17 | 34 | 11 | III | OM.F.EXT | 22 | 27 | 34 | I | EC.D.EXT | |
| | 23 | 1 | 58 | II | PA.D.EXT | | 18 | 21 | 56 | I | OC.F.INT | 22 | 31 | 19 | I | EC.D.INT | |
| | 23 | 6 | 18 | II | PA.D.INT | | 18 | 25 | 41 | I | OC.F.EXT | | | | | | |
| | 23 | 28 | 29 | II | OM.F.INT | | 19 | 3 | 53 | III | PA.D.EXT | 28 | 1 | 50 | 37 | I | OC.F.INT |
| | 23 | 32 | 54 | II | OM.F.EXT | | 19 | 14 | 44 | III | PA.D.INT | 1 | 54 | 21 | I | OC.F.EXT | |
| | | | | | | | 21 | 51 | 53 | III | PA.F.INT | 12 | 49 | 52 | II | OM.D.EXT | |
| 18 | 1 | 36 | 50 | II | PA.F.INT | | 22 | 2 | 41 | III | PA.F.EXT | 12 | 54 | 15 | II | OM.D.INT | |
| | 1 | 41 | 9 | II | PA.F.EXT | | | | | | 15 | 9 | 38 | II | PA.D.EXT | | |
| | 4 | 57 | 13 | I | OM.D.EXT | 23 | 5 | 18 | 4 | II | EC.D.PEN | 15 | 13 | 56 | II | PA.D.INT | |
| | 5 | 0 | 58 | I | OM.D.INT | | 5 | 19 | 46 | II | EC.D.EXT | 15 | 23 | 21 | II | OM.F.INT | |
| | 5 | 59 | 42 | I | PA.D.EXT | | 5 | 24 | 8 | II | EC.D.INT | 15 | 27 | 45 | II | OM.F.EXT | |
| | 6 | 3 | 26 | I | PA.D.INT | | 10 | 5 | 14 | II | OC.F.INT | 17 | 45 | 17 | II | PA.F.INT | |
| | 7 | 9 | 34 | I | OM.F.INT | | 10 | 9 | 30 | II | OC.F.EXT | 17 | 49 | 34 | II | PA.F.EXT | |
| | 7 | 13 | 19 | I | OM.F.EXT | | 12 | 22 | 35 | I | OM.D.EXT | 19 | 47 | 51 | I | OM.D.EXT | |
| | 8 | 11 | 55 | I | PA.F.INT | | 12 | 26 | 19 | I | OM.D.INT | 19 | 51 | 36 | I | OM.D.INT | |
| | 8 | 15 | 39 | I | PA.F.EXT | | 13 | 28 | 20 | I | PA.D.EXT | 20 | 56 | 33 | I | PA.D.EXT | |
| | | | | | | | 13 | 32 | 3 | I | PA.D.INT | 21 | 0 | 16 | I | PA.D.INT | |
| 19 | 0 | 34 | 52 | III | EC.D.PEN | | 14 | 34 | 52 | I | OM.F.INT | 22 | 0 | 5 | I | OM.F.INT | |
| | 0 | 38 | 55 | III | EC.D.EXT | | 14 | 38 | 36 | I | OM.F.EXT | 22 | 3 | 50 | I | OM.F.EXT | |
| | 0 | 50 | 28 | III | EC.D.INT | | 15 | 40 | 30 | I | PA.F.INT | 23 | 8 | 40 | I | PA.F.INT | |
| | 2 | 4 | 25 | I | EC.D.PEN | | 15 | 44 | 13 | I | PA.F.EXT | 23 | 12 | 23 | I | PA.F.EXT | |
| | 2 | 5 | 12 | I | EC.D.EXT | | | | | | | | | | | | |
| | 2 | 8 | 58 | I | EC.D.INT | 24 | 9 | 29 | 51 | I | EC.D.PEN | 29 | 16 | 55 | 19 | I | EC.D.PEN |
| | 3 | 17 | 0 | III | EC.F.INT | | 9 | 30 | 37 | I | EC.D.EXT | 16 | 56 | 6 | I | EC.D.EXT | |
| | 3 | 28 | 33 | III | EC.F.EXT | | 9 | 34 | 23 | I | EC.D.INT | 16 | 59 | 51 | I | EC.D.INT | |
| | 3 | 32 | 37 | III | EC.F.PEN | | 12 | 51 | 31 | I | OC.F.INT | 18 | 37 | 1 | III | OM.D.EXT | |
| | 4 | 54 | 2 | III | OC.D.EXT | | 12 | 55 | 16 | I | OC.F.EXT | 18 | 48 | 3 | III | OM.D.INT | |
| | 5 | 4 | 57 | III | OC.D.INT | | 23 | 31 | 33 | II | OM.D.EXT | 20 | 20 | 10 | I | OC.F.INT | |
| | 5 | 22 | 35 | I | OC.F.INT | | 23 | 35 | 57 | II | OM.D.INT | 20 | 23 | 55 | I | OC.F.EXT | |
| | 5 | 26 | 20 | I | OC.F.EXT | | | | | | 21 | 22 | 56 | III | OM.F.INT | | |
| | 7 | 43 | 25 | III | OC.F.INT | 25 | 1 | 47 | 7 | II | PA.D.EXT | 21 | 34 | 2 | III | OM.F.EXT | |
| | 7 | 54 | 21 | III | OC.F.EXT | | 1 | 51 | 26 | II | PA.D.INT | 23 | 19 | 29 | III | PA.D.EXT | |
| | 16 | 0 | 49 | II | EC.D.PEN | | 2 | 4 | 50 | II | OM.F.INT | 23 | 30 | 15 | III | PA.D.INT | |
| | 16 | 2 | 31 | II | EC.D.EXT | | 2 | 9 | 14 | II | OM.F.EXT | | | | | | |
| | 16 | 6 | 55 | II | EC.D.INT | | 4 | 22 | 30 | II | PA.F.INT | 30 | 2 | 8 | 26 | III | PA.F.INT |
| | 20 | 43 | 27 | II | OC.F.INT | | 4 | 26 | 48 | II | PA.F.EXT | 2 | 19 | 9 | III | PA.F.EXT | |
| | 20 | 47 | 43 | II | OC.F.EXT | | 6 | 51 | 0 | I | OM.D.EXT | 7 | 52 | 24 | II | EC.D.PEN | |
| | 23 | 25 | 43 | I | OM.D.EXT | | 6 | 54 | 44 | I | OM.D.INT | 7 | 54 | 5 | II | EC.D.EXT | |
| | 23 | 29 | 27 | I | OM.D.INT | | 7 | 57 | 46 | I | PA.D.EXT | 7 | 58 | 27 | II | EC.D.INT | |
| | | | | | | | 8 | 1 | 29 | I | PA.D.INT | 12 | 47 | 49 | II | OC.F.INT | |
| 20 | 0 | 29 | 19 | I | PA.D.EXT | | 9 | 3 | 15 | I | OM.F.INT | 12 | 52 | 3 | II | OC.F.EXT | |
| | 0 | 33 | 3 | I | PA.D.INT | | 9 | 7 | 0 | I | OM.F.EXT | 14 | 16 | 17 | I | OM.D.EXT | |
| | 1 | 38 | 2 | I | OM.F.INT | | 10 | 9 | 55 | I | PA.F.INT | 14 | 20 | 1 | I | OM.D.INT | |
| | 1 | 41 | 47 | I | OM.F.EXT | | 10 | 13 | 38 | I | PA.F.EXT | 15 | 25 | 52 | I | PA.D.EXT | |
| | 2 | 41 | 31 | I | PA.F.INT | | | | | | 15 | 29 | 35 | I | PA.D.EXT | | |
| | 2 | 45 | 14 | I | PA.F.EXT | 26 | 3 | 58 | 22 | I | EC.D.PEN | 16 | 28 | 29 | I | OM.F.INT | |
| | 20 | 32 | 52 | I | EC.D.PEN | | 3 | 59 | 8 | I | EC.D.EXT | 16 | 32 | 14 | I | OM.F.EXT | |
| | 20 | 33 | 38 | I | EC.D.EXT | | 4 | 2 | 54 | I | EC.D.INT | 17 | 37 | 59 | I | PA.F.INT | |
| | 20 | 37 | 24 | I | EC.D.INT | | 4 | 33 | 36 | III | EC.D.PEN | 17 | 41 | 41 | I | PA.F.EXT | |
| | 23 | 52 | 13 | I | OC.F.INT | | 4 | 37 | 38 | III | EC.D.EXT | | | | | | |
| | 23 | 55 | 58 | I | OC.F.EXT | | 4 | 49 | 6 | III | EC.D.INT | 31 | 11 | 23 | 46 | I | EC.D.PEN |
| | | | | | | | 7 | 16 | 45 | III | EC.F.INT | 11 | 24 | 32 | I | EC.D.EXT | |
| 21 | 10 | 13 | 51 | II | OM.D.EXT | | 7 | 21 | 8 | I | OC.F.INT | 11 | 28 | 18 | I | EC.D.INT | |
| | 10 | 18 | 15 | II | OM.D.INT | | 7 | 24 | 53 | I | OC.F.EXT | 14 | 49 | 35 | I | OC.F.INT | |
| | 12 | 25 | 1 | II | PA.D.EXT | | 7 | 28 | 14 | III | EC.F.EXT | 14 | 53 | 20 | I | OC.F.EXT | |



Dans le sens OUEST-EST, les satellites passent au-delà de Jupiter

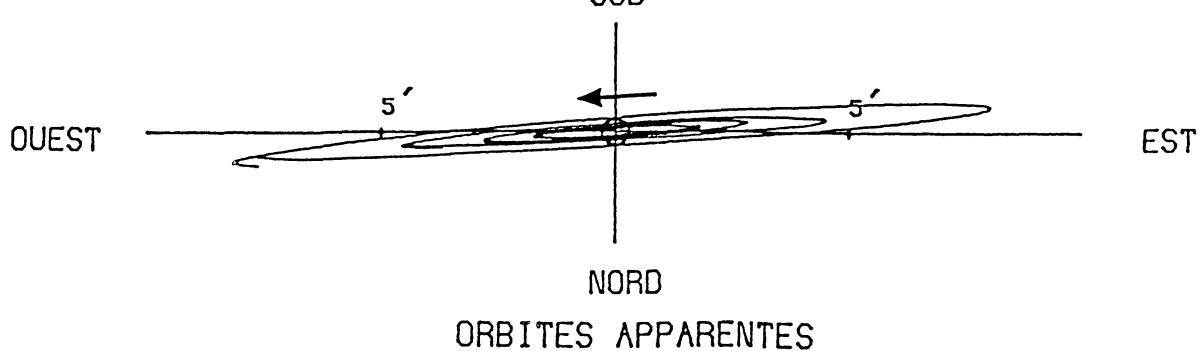


| PHENOMENES | | | | | MOIS : SEPTEMBRE - PREMIERE QUINZAINE - | | | | | | | | | | | | | |
|------------|----|----|----|-----|---|----------|----|----|-----|----------|----------|----------|----|----|----|----------|----------|----------|
| JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE | |
| 1 | 2 | 7 | 34 | II | OM.D.EXT | 22 | 36 | 23 | III | OM.D.EXT | | 8 | 36 | 34 | I | PA.F.EXT | | |
| | 2 | 11 | 57 | II | OM.D.INT | 22 | 47 | 19 | III | OM.D.INT | | 11 | 2 | 14 | 35 | I | EC.D.PEN | |
| | 4 | 31 | 7 | II | PA.D.EXT | 6 | 1 | 23 | 6 | III | OM.F.INT | | 2 | 15 | 21 | I | EC.D.EXT | |
| | 4 | 35 | 25 | II | PA.D.INT | | 1 | 34 | 8 | III | OM.F.EXT | | 2 | 19 | 7 | I | EC.D.INT | |
| | 4 | 41 | 14 | II | OM.F.INT | | 3 | 32 | 33 | III | PA.D.EXT | | 5 | 45 | 21 | I | OC.F.INT | |
| | 4 | 45 | 38 | II | OM.F.EXT | | 3 | 43 | 14 | III | PA.D.INT | | 5 | 49 | 5 | I | OC.F.EXT | |
| | 7 | 7 | 0 | II | PA.F.INT | | 6 | 22 | 24 | III | PA.F.INT | | 18 | 2 | 6 | II | OM.D.EXT | |
| | 7 | 11 | 17 | II | PA.F.EXT | | 6 | 33 | 1 | III | PA.F.EXT | | 18 | 6 | 28 | II | OM.D.INT | |
| | 8 | 44 | 40 | I | OM.D.EXT | | 10 | 26 | 31 | II | EC.D.PEN | | 20 | 35 | 5 | II | PA.D.EXT | |
| | 8 | 48 | 24 | I | OM.D.INT | | 10 | 28 | 11 | II | EC.D.INT | | 20 | 36 | 22 | II | OM.F.INT | |
| | 9 | 55 | 8 | I | PA.D.EXT | | 10 | 32 | 32 | II | EC.D.INT | | 20 | 39 | 22 | II | PA.D.INT | |
| | 9 | 58 | 51 | I | PA.D.INT | | 15 | 28 | 51 | II | OC.F.INT | | 20 | 40 | 45 | II | OM.F.EXT | |
| | 10 | 56 | 52 | I | OM.F.INT | | 15 | 33 | 4 | II | OC.F.EXT | | 23 | 11 | 39 | II | PA.F.EXT | |
| | 11 | 0 | 36 | I | OM.F.EXT | | 16 | 9 | 53 | I | OM.D.EXT | | 23 | 15 | 55 | II | PA.F.EXT | |
| | 12 | 7 | 13 | I | PA.F.INT | | 16 | 13 | 37 | I | OM.D.INT | | 23 | 35 | 2 | I | OM.D.EXT | |
| | 12 | 10 | 56 | I | PA.F.EXT | | 17 | 22 | 41 | I | PA.D.EXT | | 23 | 38 | 46 | I | OM.D.INT | |
| 2 | 5 | 52 | 16 | I | EC.D.PEN | | 17 | 26 | 24 | I | PA.D.INT | | 12 | 0 | 49 | 47 | I | PA.D.EXT |
| | 5 | 53 | 3 | I | EC.D.EXT | | 18 | 22 | 3 | I | OM.F.INT | | 0 | 53 | 29 | I | PA.D.INT | |
| | 5 | 56 | 48 | I | EC.D.INT | | 18 | 25 | 47 | I | OM.F.EXT | | 1 | 47 | 10 | I | OM.F.INT | |
| | 8 | 32 | 29 | III | EC.D.PEN | | 19 | 34 | 45 | I | PA.F.INT | | 1 | 50 | 54 | I | OM.F.EXT | |
| | 8 | 36 | 30 | III | EC.D.EXT | | 19 | 38 | 27 | I | PA.F.EXT | | 3 | 1 | 49 | I | PA.F.INT | |
| | 8 | 47 | 53 | III | EC.D.INT | | 7 | 13 | 17 | 39 | I | EC.D.PEN | | 3 | 5 | 32 | I | PA.F.EXT |
| | 9 | 19 | 3 | I | OC.F.INT | | 13 | 18 | 26 | I | EC.D.EXT | | 20 | 43 | 6 | I | EC.D.PEN | |
| | 9 | 22 | 47 | I | OC.F.EXT | | 13 | 22 | 11 | I | EC.D.INT | | 20 | 43 | 53 | I | EC.D.EXT | |
| | 11 | 16 | 40 | III | EC.F.INT | | 16 | 46 | 58 | I | OC.F.INT | | 20 | 47 | 38 | I | EC.D.INT | |
| | 11 | 28 | 3 | III | EC.F.EXT | | 16 | 50 | 42 | I | OC.F.EXT | | 13 | 0 | 14 | 32 | I | OC.F.INT |
| | 11 | 32 | 4 | III | EC.F.PEN | | 9 | 50 | 13 | II | PA.F.INT | | 0 | 18 | 16 | I | OC.F.EXT | |
| | 13 | 25 | 17 | III | OC.D.EXT | | 8 | 4 | 43 | 41 | II | OM.D.EXT | | 2 | 34 | 53 | III | OM.D.EXT |
| | 13 | 36 | 2 | III | OC.D.INT | | 4 | 48 | 4 | II | OM.D.INT | | 2 | 45 | 45 | III | OM.D.INT | |
| | 16 | 16 | 58 | III | OC.F.INT | | 7 | 13 | 53 | II | PA.D.EXT | | 5 | 22 | 27 | III | OM.F.INT | |
| | 16 | 27 | 43 | III | OC.F.EXT | | 7 | 17 | 45 | II | OM.F.INT | | 5 | 33 | 25 | III | OM.F.EXT | |
| | 21 | 9 | 28 | II | EC.D.PEN | | 7 | 18 | 10 | II | PA.D.INT | | 7 | 41 | 53 | III | PA.D.EXT | |
| | 21 | 11 | 9 | II | EC.D.EXT | | 7 | 22 | 8 | II | OM.F.EXT | | 7 | 52 | 29 | III | PA.D.INT | |
| | 21 | 15 | 30 | II | EC.D.INT | | 9 | 50 | 13 | II | PA.F.INT | | 10 | 32 | 36 | III | PA.F.INT | |
| | 3 | 2 | 8 | 33 | II | OC.F.INT | | 9 | 54 | 29 | II | PA.F.EXT | | 10 | 43 | 8 | III | PA.F.EXT |
| | 2 | 12 | 46 | II | OC.F.EXT | | 10 | 38 | 16 | I | OM.D.EXT | | 13 | 0 | 29 | II | EC.D.PEN | |
| | 3 | 13 | 7 | I | OM.D.EXT | | 10 | 41 | 59 | I | OM.D.INT | | 13 | 2 | 9 | II | EC.D.EXT | |
| | 3 | 16 | 50 | I | OM.D.INT | | 11 | 51 | 45 | I | PA.D.EXT | | 13 | 6 | 29 | II | EC.D.INT | |
| | 4 | 24 | 23 | I | PA.D.EXT | | 11 | 55 | 28 | I | PA.D.INT | | 18 | 3 | 25 | I | OM.D.EXT | |
| | 4 | 28 | 6 | I | PA.D.INT | | 12 | 50 | 24 | I | OM.F.INT | | 18 | 7 | 8 | I | OM.D.INT | |
| | 5 | 25 | 17 | I | OM.F.INT | | 12 | 54 | 8 | I | OM.F.EXT | | 18 | 8 | 16 | II | OC.F.INT | |
| | 5 | 29 | 1 | I | OM.F.EXT | | 14 | 3 | 48 | I | PA.F.INT | | 18 | 12 | 28 | II | OC.F.EXT | |
| | 6 | 36 | 28 | I | PA.F.INT | | 14 | 7 | 31 | I | PA.F.EXT | | 19 | 18 | 42 | I | PA.D.EXT | |
| | 6 | 40 | 11 | I | PA.F.EXT | | 9 | 7 | 46 | 10 | I | EC.D.PEN | | 19 | 22 | 25 | I | PA.D.INT |
| 4 | 0 | 20 | 41 | I | EC.D.PEN | | 7 | 46 | 56 | I | EC.D.EXT | | 20 | 15 | 32 | I | OM.F.INT | |
| | 0 | 21 | 28 | I | EC.D.EXT | | 7 | 50 | 42 | I | EC.D.INT | | 20 | 19 | 16 | I | OM.F.EXT | |
| | 0 | 25 | 13 | I | EC.D.INT | | 11 | 16 | 14 | I | OC.F.INT | | 21 | 30 | 44 | I | PA.F.INT | |
| | 3 | 48 | 21 | I | OC.F.INT | | 11 | 19 | 58 | I | OC.F.EXT | | 21 | 34 | 27 | I | PA.F.EXT | |
| | 3 | 52 | 5 | I | OC.F.EXT | | 12 | 31 | 27 | III | EC.D.PEN | | 14 | 15 | 11 | 33 | I | EC.D.PEN |
| | 15 | 25 | 58 | II | OM.D.EXT | | 12 | 35 | 26 | III | EC.D.EXT | | 15 | 12 | 19 | I | EC.D.EXT | |
| | 15 | 30 | 20 | II | OM.D.INT | | 12 | 46 | 45 | III | EC.D.INT | | 15 | 16 | 4 | I | EC.D.INT | |
| | 17 | 53 | 3 | II | PA.D.EXT | | 15 | 16 | 39 | III | EC.F.INT | | 18 | 43 | 35 | I | OC.F.INT | |
| | 17 | 57 | 21 | II | PA.D.INT | | 15 | 27 | 58 | III | EC.F.EXT | | 18 | 47 | 19 | I | OC.F.EXT | |
| | 17 | 59 | 50 | II | OM.F.INT | | 15 | 31 | 57 | III | EC.F.PEN | | 12 | 31 | 46 | I | OM.D.EXT | |
| | 18 | 4 | 13 | II | OM.F.EXT | | 17 | 36 | 57 | III | OC.D.EXT | | 12 | 31 | 54 | II | PA.F.EXT | |
| | 20 | 29 | 10 | II | PA.F.INT | | 17 | 47 | 38 | III | OC.D.INT | | 12 | 35 | 29 | I | OM.D.INT | |
| | 20 | 33 | 27 | II | PA.F.EXT | | 20 | 29 | 42 | III | OC.F.INT | | 13 | 47 | 34 | I | PA.D.EXT | |
| | 21 | 41 | 30 | I | OM.D.EXT | | 20 | 40 | 23 | III | OC.F.EXT | | 13 | 51 | 16 | I | PA.D.INT | |
| | 21 | 45 | 13 | I | OM.D.INT | | 23 | 43 | 30 | II | EC.D.PEN | | 14 | 43 | 53 | I | OM.F.INT | |
| | 22 | 53 | 33 | I | PA.D.EXT | | 23 | 45 | 11 | II | EC.D.INT | | 14 | 47 | 36 | I | OM.F.EXT | |
| | 22 | 57 | 16 | I | PA.D.INT | | 23 | 49 | 31 | II | EC.D.INT | | 15 | 59 | 25 | II | PA.D.INT | |
| | 23 | 53 | 40 | I | OM.F.INT | | | | | | | | 15 | 59 | 46 | I | OM.D.EXT | |
| | 23 | 57 | 24 | I | OM.F.EXT | | 10 | 4 | 48 | 47 | II | OC.F.INT | | 12 | 36 | 10 | II | PA.F.EXT |
| | | | | | | | | 4 | 52 | 59 | II | OC.F.EXT | | 12 | 36 | 10 | II | PA.F.EXT |
| 5 | 1 | 5 | 38 | I | PA.F.INT | | 5 | 6 | 41 | I | OM.D.EXT | | 13 | 47 | 34 | I | PA.D.EXT | |
| | 1 | 9 | 20 | I | PA.F.EXT | | 5 | 10 | 24 | I | OM.D.INT | | 13 | 51 | 16 | I | PA.D.INT | |
| | 18 | 49 | 13 | I | EC.D.PEN | | 6 | 20 | 49 | I | PA.D.EXT | | 14 | 43 | 53 | I | OM.F.INT | |
| | 18 | 49 | 59 | I | EC.D.EXT | | 6 | 24 | 31 | I | PA.D.INT | | 14 | 47 | 36 | I | OM.F.EXT | |
| | 18 | 53 | 45 | I | EC.D.INT | | 7 | 18 | 48 | I | OM.F.INT | | 15 | 59 | 36 | I | PA.F.INT | |
| | 22 | 17 | 44 | I | OC.F.INT | | 7 | 22 | 32 | I | OM.F.EXT | | 16 | 3 | 18 | I | PA.F.EXT | |
| | 22 | 21 | 28 | I | OC.F.EXT | | 8 | 32 | 51 | I | PA.F.INT | | | | | | | |



Dans le sens OUEST-EST, les satellites passent au-delà de Jupiter

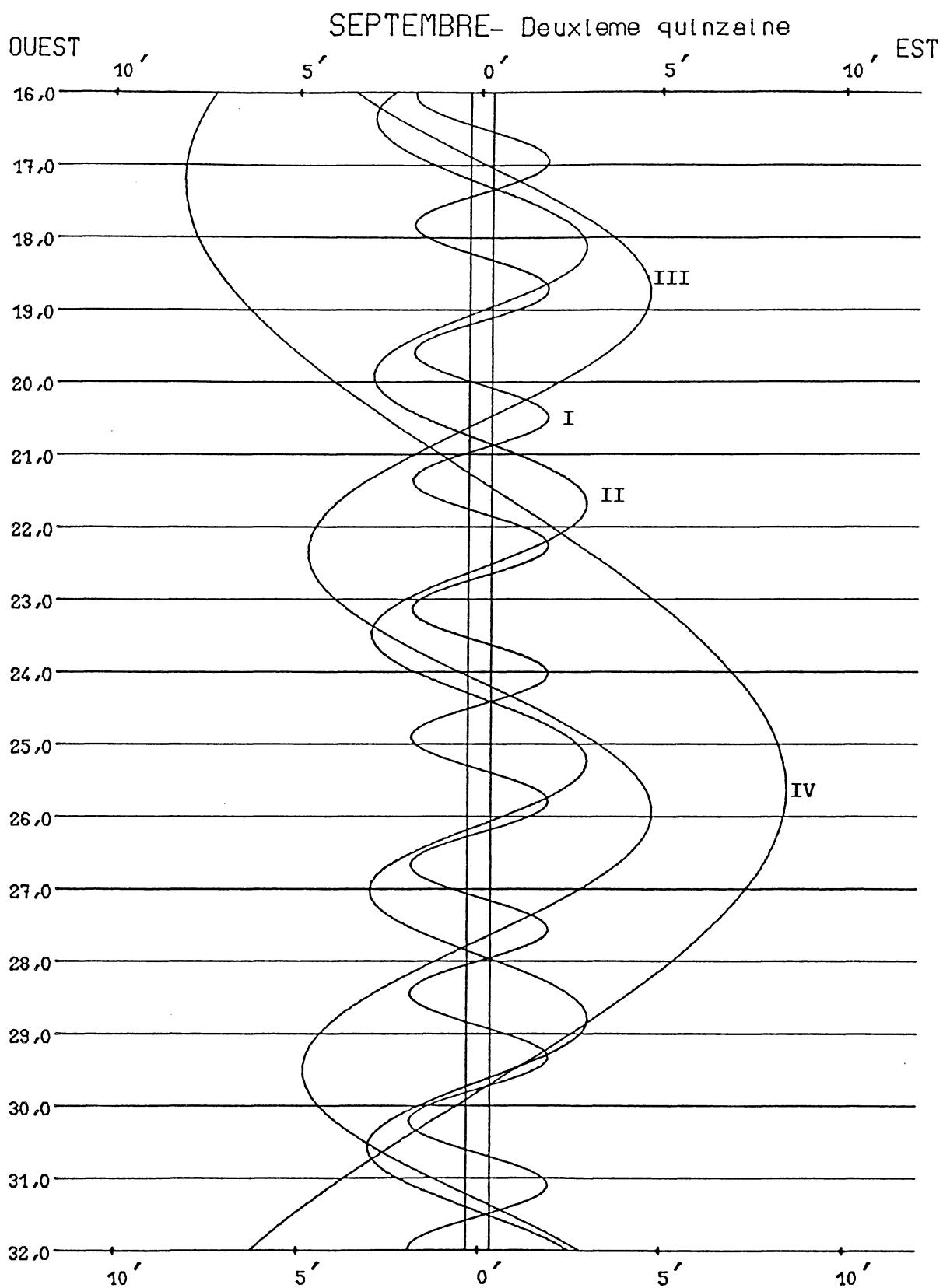
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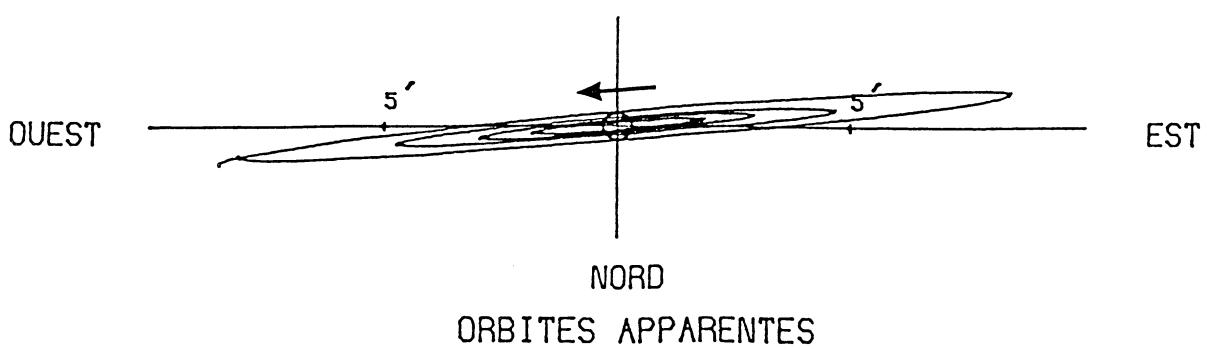
1989 - SATELLITES DE JUPITER -

| PHENOMENES | | | | | | MOIS : SEPTEMBRE - DEUXIEME QUINZAINE - | | | | | | | | | | | |
|------------|----|----|-----|----------|----------|---|----|----|----------|----------|----------|------|----|----|----------|----------|----------|
| JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE |
| 16 | 9 | 40 | 3 | I | EC.D.PEN | 20 | 45 | 56 | II | OC.F.INT | | 1 | 54 | 0 | II | OM.F.EXT | |
| | 9 | 40 | 49 | I | EC.D.EXT | 20 | 50 | 7 | II | OC.F.EXT | | 1 | 54 | 26 | II | PA.D.EXT | |
| | 9 | 44 | 35 | I | EC.D.INT | 21 | 13 | 53 | I | PA.D.EXT | | 1 | 58 | 41 | II | PA.D.INT | |
| 13 | 12 | 39 | I | OC.F.INT | 21 | 17 | 35 | I | PA.D.INT | | 3 | 21 | 54 | I | OM.D.EXT | | |
| 13 | 16 | 23 | I | OC.F.EXT | 22 | 8 | 58 | I | OM.F.INT | | 3 | 25 | 37 | I | OM.D.INT | | |
| 16 | 31 | 17 | III | EC.D.PEN | 22 | 12 | 42 | I | OM.F.EXT | | 4 | 31 | 48 | II | PA.F.INT | | |
| 16 | 35 | 14 | III | EC.D.EXT | 23 | 25 | 55 | I | PA.F.INT | | 4 | 36 | 3 | II | PA.F.EXT | | |
| 16 | 46 | 29 | III | EC.D.INT | 23 | 29 | 37 | I | PA.F.EXT | | 4 | 39 | 41 | I | PA.D.EXT | | |
| 19 | 17 | 30 | III | EC.F.INT | | | | | | | | 4 | 43 | 23 | I | PA.D.INT | |
| 19 | 28 | 45 | III | EC.F.EXT | 21 | 17 | 5 | 25 | I | EC.D.PEN | | 5 | 34 | 1 | I | OM.F.INT | |
| 19 | 32 | 42 | III | EC.F.PEN | | | | | I | EC.D.EXT | | 5 | 37 | 45 | I | OM.F.EXT | |
| 21 | 46 | 19 | III | OC.D.EXT | | | | | I | EC.D.INT | | 6 | 51 | 43 | I | PA.F.INT | |
| 21 | 56 | 56 | III | OC.D.INT | | | | | I | OC.F.INT | | 6 | 55 | 25 | I | PA.F.EXT | |
| 17 | 0 | 40 | 4 | III | OC.F.INT | | | | | I | OC.F.EXT | 27 | 0 | 30 | 52 | I | EC.D.PEN |
| | 0 | 50 | 41 | III | OC.F.EXT | 22 | 9 | 56 | 1 | II | OM.D.EXT | | 0 | 31 | 38 | I | EC.D.EXT |
| 2 | 17 | 25 | II | EC.D.PEN | | | | | II | OM.D.INT | | 0 | 35 | 23 | I | EC.D.INT | |
| 2 | 19 | 5 | II | EC.D.EXT | | | | | II | OM.F.INT | | 4 | 5 | 38 | I | OC.F.INT | |
| 2 | 23 | 24 | II | EC.D.INT | | | | | II | PA.D.EXT | | 4 | 9 | 21 | I | OC.F.EXT | |
| 7 | 0 | 9 | I | OM.D.EXT | | | | | II | OM.F.EXT | | 10 | 31 | 34 | III | OM.D.EXT | |
| 7 | 3 | 53 | I | OM.D.INT | | | | | II | PA.D.INT | | 10 | 42 | 18 | III | OM.D.INT | |
| 7 | 27 | 22 | II | OC.F.INT | | | | | II | OM.D.INT | | 13 | 20 | 57 | III | OM.F.INT | |
| 7 | 31 | 33 | II | OC.F.EXT | | | | | I | OM.D.EXT | | 13 | 31 | 47 | III | OM.F.EXT | |
| 8 | 16 | 25 | I | PA.D.EXT | | | | | I | OM.D.INT | | 15 | 50 | 25 | III | PA.D.EXT | |
| 8 | 20 | 7 | I | PA.D.INT | | | | | I | PA.F.EXT | | 16 | 0 | 54 | III | PA.D.INT | |
| 9 | 12 | 16 | I | OM.F.INT | | | | | I | PA.D.INT | | 18 | 7 | 57 | II | EC.D.PEN | |
| 9 | 16 | 0 | I | OM.F.EXT | | | | | I | PA.D.INT | | 18 | 9 | 36 | II | EC.D.EXT | |
| 10 | 28 | 26 | I | PA.F.INT | | | | | I | OM.F.INT | | 18 | 13 | 54 | II | EC.D.INT | |
| 10 | 32 | 8 | I | PA.F.EXT | | | | | I | OM.F.EXT | | 18 | 42 | 46 | III | PA.F.EXT | |
| | | | | | | | | | I | PA.F.INT | | 18 | 53 | 11 | III | PA.F.EXT | |
| 18 | 4 | 8 | 28 | I | EC.D.PEN | | | | I | PA.F.EXT | | 20 | 41 | 29 | II | EC.F.INT | |
| | 4 | 9 | 14 | I | EC.D.EXT | | | | I | PA.F.EXT | | 20 | 44 | 31 | II | OC.D.EXT | |
| 4 | 12 | 59 | I | EC.D.INT | 23 | 11 | 33 | 56 | I | EC.D.PEN | | 20 | 45 | 47 | II | EC.F.EXT | |
| 7 | 41 | 33 | I | OC.F.INT | | | | | I | EC.D.EXT | | 20 | 47 | 26 | II | EC.F.PEN | |
| 7 | 45 | 17 | I | OC.F.EXT | | | | | I | EC.D.INT | | 20 | 48 | 41 | II | OC.D.INT | |
| 20 | 38 | 16 | II | OM.D.EXT | | | | | I | OC.F.INT | | 21 | 50 | 14 | I | OM.D.EXT | |
| 20 | 42 | 37 | II | OM.D.INT | | | | | I | OC.F.EXT | | 21 | 53 | 57 | I | OM.D.INT | |
| 23 | 12 | 57 | II | OM.F.INT | | | | | III | EC.D.PEN | | 23 | 8 | 9 | I | PA.D.EXT | |
| 23 | 15 | 35 | II | PA.D.EXT | | | | | III | EC.D.EXT | | 23 | 11 | 51 | I | PA.D.INT | |
| 23 | 17 | 20 | II | OM.F.EXT | | | | | III | EC.D.INT | | 23 | 21 | 44 | II | OC.F.INT | |
| 23 | 19 | 51 | II | PA.D.INT | | | | | III | EC.F.INT | | 23 | 25 | 54 | II | OC.F.EXT | |
| | | | | | | | | | III | EC.F.EXT | | | | | | | |
| 19 | 1 | 28 | 30 | I | OM.D.EXT | | | | | III | EC.F.PEN | 28 | 0 | 2 | 22 | I | OM.F.INT |
| | 1 | 32 | 13 | I | OM.D.INT | | | | | III | EC.F.EXT | | 0 | 6 | 5 | I | OM.F.EXT |
| 1 | 52 | 34 | II | PA.F.INT | 24 | 1 | 51 | 28 | III | OC.D.EXT | | 1 | 20 | 12 | I | PA.F.INT | |
| 1 | 56 | 49 | II | PA.F.EXT | | 2 | 2 | 1 | III | OC.D.INT | | 1 | 23 | 53 | I | PA.F.EXT | |
| 2 | 45 | 10 | I | PA.D.EXT | | 4 | 46 | 8 | III | OC.F.INT | | 18 | 59 | 18 | I | EC.D.PEN | |
| 2 | 48 | 53 | I | PA.D.INT | | 4 | 51 | 9 | II | EC.D.PEN | | 19 | 0 | 4 | I | EC.D.EXT | |
| 3 | 40 | 37 | I | OM.F.INT | | 4 | 52 | 49 | II | EC.D.EXT | | 19 | 3 | 49 | I | EC.D.INT | |
| 3 | 44 | 21 | I | OM.F.EXT | | 4 | 56 | 41 | III | OC.F.INT | | 22 | 34 | 13 | I | OC.F.INT | |
| 4 | 57 | 12 | I | PA.F.INT | | 4 | 57 | 7 | II | EC.D.INT | | 22 | 37 | 57 | I | OC.F.EXT | |
| 5 | 0 | 54 | I | PA.F.EXT | | 7 | 24 | 31 | II | EC.F.INT | | | | | | | |
| 22 | 36 | 59 | I | EC.D.PEN | | 7 | 27 | 3 | II | OC.D.EXT | 29 | 12 | 32 | 14 | II | OM.D.EXT | |
| 22 | 37 | 46 | I | EC.D.EXT | | 7 | 28 | 49 | II | EC.F.EXT | | 12 | 36 | 34 | II | OM.D.INT | |
| 22 | 41 | 31 | I | EC.D.INT | | 7 | 30 | 28 | II | EC.F.PEN | | 15 | 7 | 34 | II | OM.F.INT | |
| | | | | | | 7 | 31 | 13 | II | OC.D.INT | | 15 | 11 | 56 | II | OM.F.EXT | |
| 20 | 2 | 10 | 32 | I | OC.F.INT | | 8 | 53 | 34 | I | OM.D.EXT | | 15 | 12 | 43 | II | PA.D.EXT |
| | 2 | 14 | 16 | I | OC.F.EXT | | 8 | 57 | 17 | I | OM.D.INT | | 15 | 16 | 58 | II | PA.D.INT |
| 6 | 33 | 8 | III | OM.D.EXT | | 10 | 4 | 6 | II | OC.F.INT | | 16 | 18 | 33 | I | OM.D.EXT | |
| 6 | 43 | 56 | III | OM.D.INT | | 10 | 8 | 17 | II | OC.F.EXT | | 16 | 22 | 15 | I | OM.D.INT | |
| 9 | 21 | 35 | III | OM.F.INT | | 10 | 11 | 9 | I | PA.D.EXT | | 17 | 36 | 33 | I | PA.D.EXT | |
| 9 | 32 | 29 | III | OM.F.EXT | | 10 | 14 | 51 | I | PA.D.INT | | 17 | 40 | 15 | I | PA.D.INT | |
| 11 | 47 | 46 | III | PA.D.EXT | | 11 | 5 | 41 | I | OM.F.INT | | 17 | 50 | 16 | II | PA.F.INT | |
| 11 | 58 | 18 | III | PA.D.INT | | 11 | 9 | 24 | I | OM.F.EXT | | 17 | 54 | 30 | II | PA.F.EXT | |
| 14 | 39 | 19 | III | PA.F.INT | | 12 | 23 | 10 | I | PA.F.INT | | 18 | 30 | 42 | I | OM.F.INT | |
| 14 | 49 | 47 | III | PA.F.EXT | | 12 | 26 | 52 | I | PA.F.EXT | | 18 | 34 | 25 | I | OM.F.EXT | |
| 15 | 34 | 17 | II | EC.D.PEN | | | | | I | PA.F.EXT | | 19 | 48 | 36 | I | PA.F.INT | |
| 15 | 35 | 56 | II | EC.D.EXT | 25 | 6 | 2 | 20 | I | EC.D.PEN | | 19 | 52 | 18 | I | PA.F.EXT | |
| 15 | 40 | 15 | II | EC.D.INT | | 6 | 3 | 7 | I | EC.D.EXT | | | | | | | |
| 18 | 7 | 28 | II | EC.F.INT | | 6 | 6 | 52 | I | EC.D.INT | 30 | 13 | 27 | 49 | I | EC.D.PEN | |
| 18 | 9 | 3 | II | OC.D.EXT | | 9 | 36 | 53 | I | OC.F.INT | | 13 | 28 | 35 | I | EC.D.EXT | |
| 18 | 11 | 46 | II | EC.F.EXT | | 9 | 40 | 37 | I | OC.F.EXT | | 13 | 32 | 20 | I | EC.D.INT | |
| 18 | 13 | 13 | II | OC.D.INT | | 23 | 14 | 31 | II | OM.D.EXT | | 17 | 2 | 50 | I | OC.F.INT | |
| 18 | 13 | 26 | II | EC.F.PEN | | 23 | 18 | 52 | II | OM.D.INT | | 17 | 6 | 34 | I | OC.F.EXT | |
| 19 | 56 | 51 | I | OM.D.EXT | | | | | | | | | | | | | |
| 20 | 0 | 35 | I | OM.D.INT | 26 | 1 | 49 | 38 | II | OM.F.INT | | | | | | | |

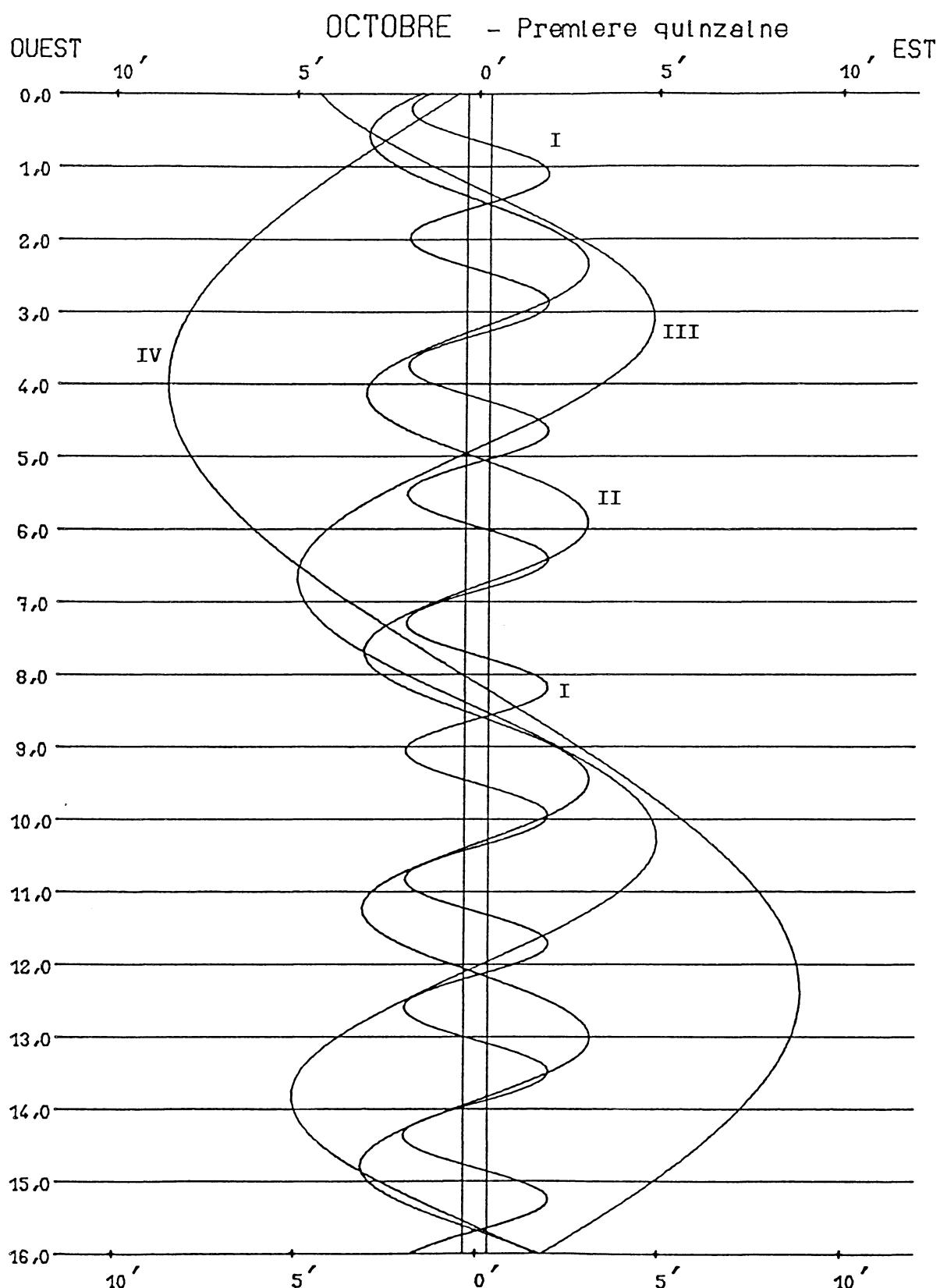


Dans le sens OUEST-EST, les satellites passent au-delà de Jupiter

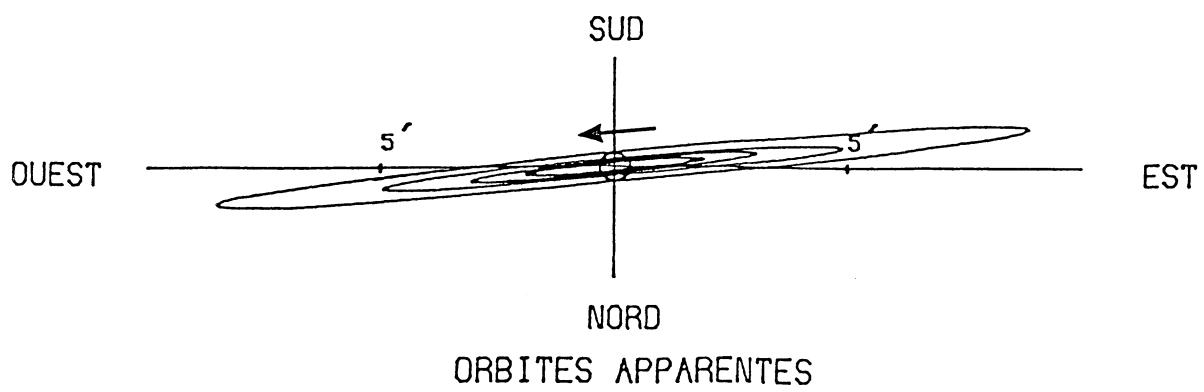
SUD



| PHENOMENES | | | | | | MOIS : | | | OCTOBRE - PREMIERE QUINZAINE - | | | | | | | | |
|------------|----|----|----|-----|----------|--------|----|----|--------------------------------|----------|----------|------|----|----|-----|----------|----------|
| JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE |
| 1 | 0 | 29 | 42 | III | EC.D.PEN | 3 | 13 | 32 | I | PA.F.INT | | 10 | 37 | 53 | I | PA.F.INT | |
| | 0 | 33 | 37 | III | EC.D.EXT | 3 | 17 | 13 | I | PA.F.EXT | | 10 | 41 | 35 | I | PA.F.EXT | |
| | 0 | 44 | 42 | III | EC.D.INT | 20 | 53 | 11 | I | EC.D.PEN | | | | | | | |
| | 3 | 17 | 56 | III | EC.F.INT | 20 | 53 | 57 | I | EC.D.EXT | 11 | 4 | 18 | 39 | I | EC.D.PEN | |
| | 3 | 29 | 2 | III | EC.F.EXT | 20 | 57 | 43 | I | EC.D.INT | | 4 | 19 | 25 | I | EC.D.EXT | |
| | 3 | 32 | 57 | III | EC.F.PEN | | | | | | | 4 | 23 | 10 | I | EC.D.INT | |
| | 5 | 52 | 57 | III | OC.D.EXT | 6 | 0 | 28 | 6 | I | OC.F.INT | 7 | 52 | 52 | I | OC.F.INT | |
| | 6 | 3 | 25 | III | OC.D.INT | 0 | 31 | 50 | I | OC.F.EXT | | 7 | 56 | 35 | I | OC.F.EXT | |
| | 7 | 24 | 48 | II | EC.D.PEN | 15 | 8 | 29 | II | OM.D.EXT | | 18 | 29 | 20 | III | OM.D.EXT | |
| | 7 | 26 | 27 | II | EC.D.EXT | 15 | 12 | 48 | II | OM.D.INT | | 18 | 39 | 56 | III | OM.D.INT | |
| | 7 | 30 | 44 | II | EC.D.INT | 17 | 44 | 18 | II | OM.F.INT | | 21 | 20 | 40 | III | OM.F.INT | |
| | 8 | 48 | 24 | III | OC.F.INT | 17 | 48 | 38 | II | OM.F.EXT | | 21 | 31 | 22 | III | OM.F.EXT | |
| | 8 | 58 | 53 | III | OC.F.EXT | 17 | 48 | 39 | II | PA.D.EXT | | 23 | 15 | 2 | II | EC.D.PEN | |
| | 9 | 58 | 31 | II | EC.F.INT | 17 | 52 | 53 | II | PA.D.INT | | 23 | 16 | 40 | II | EC.D.INT | |
| | 10 | 1 | 35 | II | OC.D.EXT | 18 | 11 | 50 | I | OM.D.EXT | | 23 | 20 | 56 | III | PA.D.EXT | |
| | 10 | 2 | 48 | II | EC.F.EXT | 18 | 15 | 33 | I | OM.D.INT | | 23 | 44 | 36 | III | PA.D.EXT | |
| | 10 | 4 | 27 | II | EC.F.PEN | 19 | 29 | 36 | I | PA.D.EXT | | 23 | 54 | 58 | III | PA.D.EXT | |
| | 10 | 5 | 45 | II | OC.D.INT | 19 | 33 | 17 | I | PA.D.INT | | | | | | | |
| | 10 | 46 | 54 | I | OM.D.EXT | 20 | 24 | 3 | I | OM.F.INT | 12 | 1 | 36 | 48 | I | OM.D.EXT | |
| | 10 | 50 | 37 | I | OM.D.INT | 20 | 26 | 33 | II | PA.F.INT | | 1 | 40 | 30 | I | OM.D.INT | |
| | 12 | 4 | 56 | I | PA.D.EXT | 20 | 27 | 47 | I | OM.F.EXT | | 2 | 38 | 22 | III | PA.F.INT | |
| | 12 | 8 | 38 | I | PA.D.INT | 20 | 30 | 47 | II | PA.F.EXT | | 2 | 48 | 40 | III | PA.F.EXT | |
| | 12 | 38 | 57 | II | OC.F.INT | 21 | 41 | 42 | I | PA.F.INT | | 2 | 53 | 43 | I | PA.D.EXT | |
| | 12 | 43 | 6 | II | OC.F.EXT | 21 | 45 | 23 | I | PA.F.EXT | | 2 | 57 | 24 | I | PA.D.INT | |
| | 12 | 59 | 3 | I | OM.F.INT | | | | | | | 3 | 49 | 5 | I | OM.F.INT | |
| | 13 | 2 | 47 | I | OM.F.EXT | 7 | 15 | 21 | 42 | I | EC.D.PEN | | 3 | 52 | 48 | I | OM.F.EXT |
| | 14 | 16 | 59 | I | PA.F.INT | 15 | 22 | 28 | I | EC.D.EXT | | 4 | 27 | 16 | II | OC.F.INT | |
| | 14 | 20 | 41 | I | PA.F.EXT | 15 | 26 | 14 | I | EC.D.INT | | 4 | 31 | 24 | II | OC.F.EXT | |
| | | | | | | 18 | 56 | 28 | I | OC.F.INT | | 5 | 5 | 52 | I | PA.F.INT | |
| 2 | 7 | 56 | 13 | I | EC.D.PEN | 19 | 0 | 11 | I | OC.F.EXT | | 5 | 9 | 34 | I | PA.F.EXT | |
| | 7 | 56 | 59 | I | EC.D.EXT | | | | | | | 22 | 47 | 5 | I | EC.D.PEN | |
| | 8 | 0 | 45 | I | EC.D.INT | 8 | 2 | 26 | 35 | IV | OC.D.EXT | | 22 | 47 | 51 | I | EC.D.EXT |
| | 11 | 31 | 16 | I | OC.F.INT | 3 | 58 | 37 | IV | OC.F.EXT | | 22 | 51 | 36 | I | EC.D.INT | |
| | 11 | 35 | 0 | I | OC.F.EXT | 4 | 28 | 22 | III | EC.D.PEN | | | | | | | |
| 3 | 1 | 50 | 45 | II | OM.D.EXT | 4 | 43 | 15 | III | EC.D.INT | 13 | 2 | 20 | 56 | I | OC.F.INT | |
| | 1 | 55 | 5 | II | OM.D.INT | 7 | 17 | 36 | III | EC.F.INT | | 2 | 24 | 40 | I | OC.F.EXT | |
| | 4 | 26 | 21 | II | OM.F.INT | 7 | 28 | 37 | III | EC.F.EXT | | 17 | 44 | 46 | II | OM.D.EXT | |
| | 4 | 30 | 42 | II | OM.F.EXT | 7 | 32 | 31 | III | EC.F.PEN | | 17 | 49 | 5 | II | OM.D.INT | |
| | 4 | 31 | 22 | II | PA.D.EXT | 9 | 49 | 44 | III | OC.D.INT | | 20 | 5 | 5 | I | OM.D.EXT | |
| | 4 | 35 | 37 | II | PA.D.INT | 9 | 58 | 20 | II | EC.D.PEN | | 20 | 8 | 48 | I | OM.D.INT | |
| | 5 | 15 | 13 | I | OM.D.EXT | 9 | 59 | 58 | II | EC.D.EXT | | 20 | 21 | 6 | II | OM.F.INT | |
| | 5 | 18 | 56 | I | OM.D.INT | 10 | 0 | 10 | III | OC.D.INT | | 20 | 22 | 31 | II | PA.D.EXT | |
| | 6 | 33 | 13 | I | PA.D.EXT | 10 | 4 | 14 | II | EC.D.INT | | 20 | 25 | 26 | II | OM.F.EXT | |
| | 6 | 36 | 55 | I | PA.D.INT | 12 | 32 | 24 | II | EC.F.INT | | 20 | 26 | 45 | II | PA.D.INT | |
| | 7 | 9 | 6 | II | PA.F.INT | 12 | 34 | 5 | II | OC.D.EXT | | 21 | 21 | 36 | I | PA.D.EXT | |
| | 7 | 13 | 20 | II | PA.F.EXT | 12 | 36 | 40 | II | EC.F.EXT | | 21 | 25 | 17 | I | PA.D.INT | |
| | 7 | 27 | 24 | I | OM.F.INT | 12 | 38 | 14 | II | OC.D.INT | | 22 | 17 | 25 | I | OM.F.INT | |
| | 7 | 31 | 7 | I | OM.F.EXT | 12 | 38 | 18 | II | EC.F.PEN | | 22 | 21 | 8 | I | OM.F.EXT | |
| | 8 | 45 | 18 | I | PA.F.INT | 12 | 40 | 11 | I | OM.D.EXT | | 23 | 0 | 45 | II | PA.F.INT | |
| | 8 | 48 | 59 | I | PA.F.EXT | 12 | 43 | 53 | I | OM.D.INT | | 23 | 4 | 58 | II | PA.F.EXT | |
| | | | | | | 12 | 45 | 54 | III | OC.F.INT | | 23 | 33 | 47 | I | PA.F.INT | |
| 4 | 2 | 24 | 45 | I | EC.D.PEN | 12 | 56 | 20 | III | OC.F.EXT | | 23 | 37 | 28 | I | PA.F.EXT | |
| | 2 | 25 | 31 | I | EC.D.EXT | 13 | 57 | 43 | I | PA.D.EXT | 14 | 17 | 15 | 37 | I | EC.D.PEN | |
| | 2 | 29 | 16 | I | EC.D.INT | 14 | 1 | 24 | I | PA.D.INT | | 17 | 16 | 23 | I | EC.D.EXT | |
| | 5 | 59 | 46 | I | OC.F.INT | 14 | 52 | 25 | I | OM.F.INT | | 17 | 20 | 8 | I | EC.D.INT | |
| | 6 | 3 | 30 | I | OC.F.EXT | 14 | 56 | 8 | I | OM.F.EXT | | 20 | 49 | 2 | I | OC.F.INT | |
| | 14 | 30 | 5 | III | OM.D.EXT | 15 | 11 | 42 | II | OC.F.INT | | 20 | 52 | 45 | I | OC.F.EXT | |
| | 14 | 40 | 45 | III | OM.D.INT | 15 | 15 | 51 | II | OC.F.EXT | | | | | | | |
| | 17 | 20 | 25 | III | OM.F.INT | 16 | 9 | 50 | I | PA.F.INT | 15 | 8 | 26 | 56 | III | EC.D.PEN | |
| | 17 | 31 | 11 | III | OM.F.EXT | 16 | 13 | 31 | I | PA.F.EXT | | 8 | 30 | 48 | III | EC.D.EXT | |
| | 19 | 49 | 13 | III | PA.D.EXT | | | | | | | 8 | 41 | 44 | III | EC.D.INT | |
| | 19 | 59 | 38 | III | PA.D.INT | 9 | 9 | 50 | 7 | I | EC.D.PEN | 11 | 17 | 12 | III | EC.F.INT | |
| | 20 | 41 | 33 | II | EC.D.PEN | 9 | 50 | 53 | I | EC.D.EXT | | 11 | 28 | 8 | III | EC.F.EXT | |
| | 20 | 43 | 11 | II | EC.D.EXT | 9 | 54 | 38 | I | EC.D.INT | | 11 | 32 | 0 | III | EC.F.PEN | |
| | 20 | 47 | 28 | II | EC.D.INT | 13 | 24 | 38 | I | OC.F.INT | | 12 | 31 | 48 | II | EC.D.PEN | |
| | 22 | 42 | 18 | III | PA.F.INT | 13 | 28 | 22 | I | OC.F.EXT | | 12 | 33 | 26 | II | EC.D.EXT | |
| | 22 | 52 | 39 | III | PA.F.EXT | | | | | | | 12 | 37 | 41 | II | EC.D.INT | |
| | 23 | 15 | 26 | II | EC.F.INT | 10 | 4 | 27 | 4 | II | OM.D.EXT | 13 | 42 | 9 | III | OC.D.EXT | |
| | 23 | 18 | 4 | II | OC.D.EXT | 4 | 31 | 23 | II | OM.D.INT | | 13 | 52 | 32 | III | OC.D.INT | |
| | 23 | 19 | 43 | II | EC.F.EXT | 7 | 3 | 9 | II | OM.F.INT | | 14 | 33 | 25 | I | OM.D.EXT | |
| | 23 | 21 | 21 | II | EC.F.PEN | 7 | 6 | 19 | II | PA.D.EXT | | 14 | 37 | 7 | I | OM.D.INT | |
| | 23 | 22 | 13 | II | OC.D.INT | 7 | 7 | 29 | II | OM.F.EXT | | 15 | 49 | 27 | I | PA.D.EXT | |
| | 23 | 43 | 32 | I | OM.D.EXT | 7 | 8 | 29 | I | OM.D.INT | | 15 | 53 | 8 | I | PA.D.INT | |
| | 23 | 47 | 15 | I | OM.D.INT | 7 | 10 | 33 | II | PA.D.INT | | 16 | 38 | 56 | III | OC.F.INT | |
| | | | | | | 7 | 12 | 12 | I | OM.D.INT | | 16 | 45 | 46 | I | OM.F.INT | |
| 5 | 1 | 1 | 26 | I | PA.D.EXT | 8 | 25 | 45 | I | PA.D.EXT | | 16 | 49 | 19 | III | OC.F.EXT | |
| | 1 | 5 | 8 | I | PA.D.INT | 8 | 29 | 27 | I | PA.D.INT | | 16 | 49 | 29 | I | OM.F.EXT | |
| | 1 | 55 | 34 | II | OC.F.INT | 9 | 20 | 45 | I | OM.F.INT | | 17 | 42 | 18 | II | OC.F.INT | |
| | 1 | 55 | 44 | I | OM.F.INT | 9 | 24 | 28 | I | OM.F.EXT | | 17 | 46 | 26 | II | OC.F.EXT | |
| | 1 | 59 | 27 | I | OM.F.EXT | 9 | 44 | 23 | II | PA.F.INT | | 18 | 1 | 39 | I | PA.F.INT | |
| | 1 | 59 | 43 | II | OC.F.EXT | 9 | 48 | 37 | II | PA.F.EXT | | 18 | 5 | 20 | I | PA.F.EXT | |

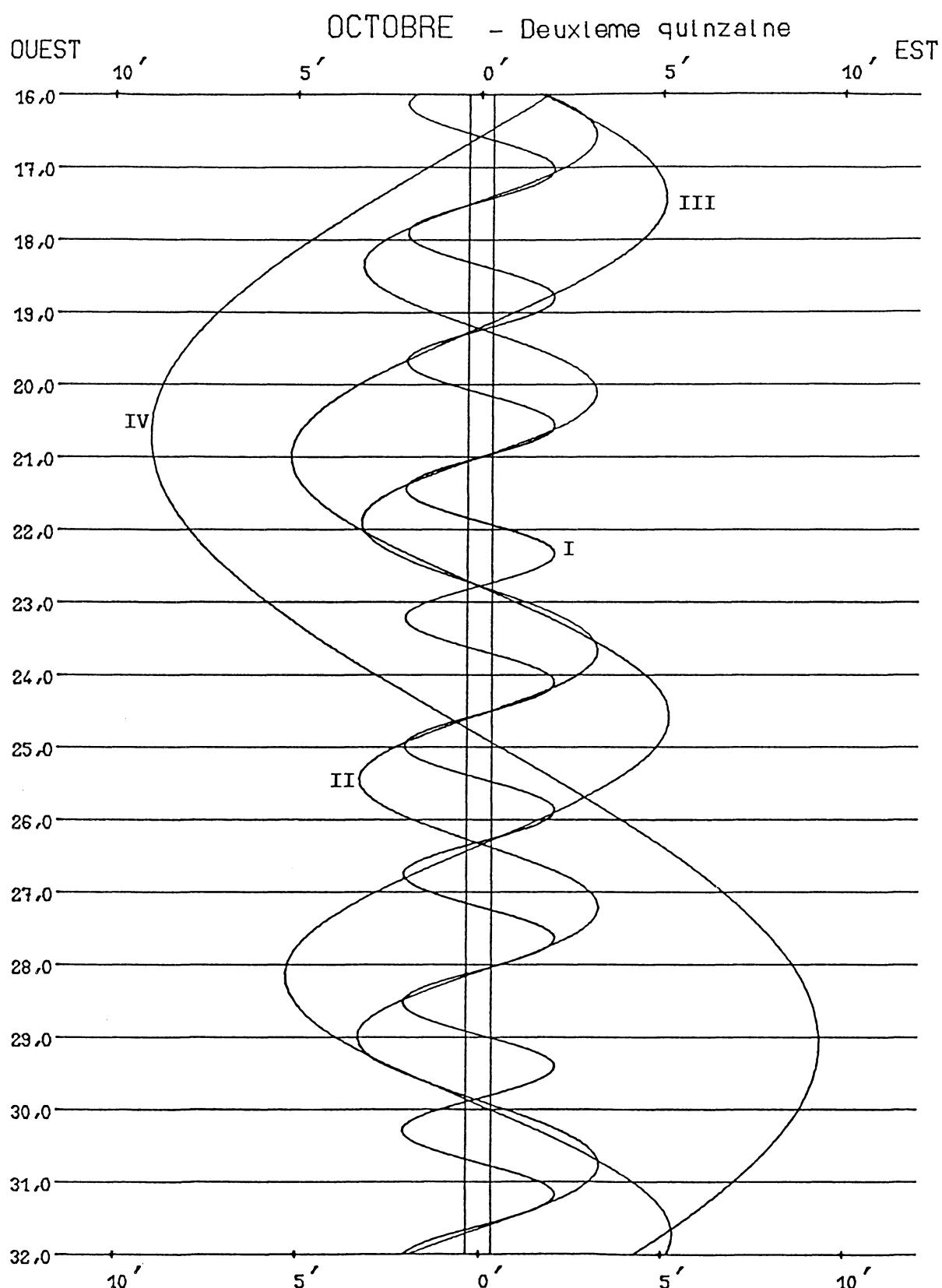


Dans le sens OUEST-EST, les satellites passent au-delà de Jupiter

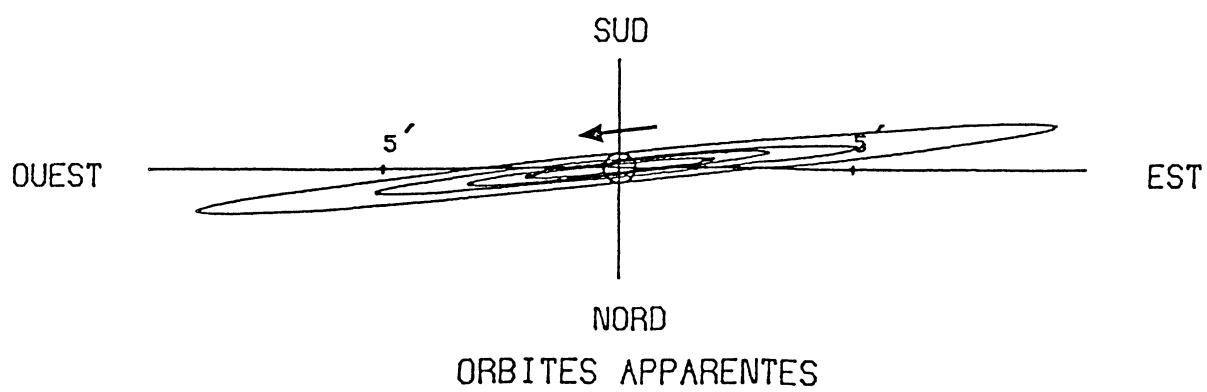


PHENOMENES MOIS : OCTOBRE - DEUXIEME QUINZAINE -

| JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE |
|------|----|----|----|-----|----------|------|----|----|-----|----------|----------|------|----|-----|----------|----------|----------|
| 16 | 11 | 44 | 2 | I | EC.D.PEN | 22 | 40 | 30 | I | OC.F.INT | | 10 | 25 | 47 | III | PA.F.EXT | |
| | 11 | 44 | 48 | I | EC.D.EXT | 22 | 44 | 13 | I | OC.F.EXT | 27 | 2 | 34 | 59 | I | EC.D.PEN | |
| | 11 | 48 | 33 | I | EC.D.INT | | | | | | 235 | 45 | | | I | EC.D.EXT | |
| | 12 | 50 | 17 | IV | PA.D.EXT | 22 | 12 | 25 | 46 | III | EC.D.PEN | 2 | 39 | 30 | I | EC.D.INT | |
| | 14 | 29 | 14 | IV | PA.F.EXT | | 12 | 29 | 37 | III | EC.D.EXT | 6 | 3 | 17 | I | OC.F.INT | |
| | 15 | 16 | 56 | I | OC.F.INT | 12 | 40 | 29 | III | EC.D.INT | 6 | 7 | 1 | I | OC.F.EXT | | |
| | 15 | 20 | 39 | I | OC.F.EXT | 15 | 5 | 14 | II | EC.D.PEN | | 22 | 57 | 25 | II | OM.D.EXT | |
| | | | | | | 15 | 6 | 52 | II | EC.D.EXT | 23 | 1 | 43 | II | OM.D.INT | | |
| 17 | 7 | 3 | 21 | II | OM.D.EXT | 15 | 11 | 6 | II | EC.D.INT | 23 | 51 | 30 | I | OM.D.EXT | | |
| | 7 | 7 | 40 | II | OM.D.INT | 15 | 17 | 3 | III | EC.F.INT | 23 | 55 | 12 | I | OM.D.INT | | |
| | 9 | 1 | 43 | I | OM.D.EXT | 15 | 27 | 56 | III | EC.F.EXT | | | | | | | |
| | 9 | 5 | 25 | I | OM.D.INT | 15 | 31 | 46 | III | EC.F.PEN | 28 | 1 | 2 | 20 | I | PA.D.EXT | |
| | 9 | 39 | 5 | II | PA.D.EXT | 16 | 26 | 37 | I | OM.D.EXT | 1 | 6 | 2 | I | PA.D.EXT | | |
| | 9 | 39 | 57 | II | OM.F.INT | 16 | 30 | 19 | I | OM.D.INT | 1 | 23 | 32 | II | PA.D.EXT | | |
| | 9 | 43 | 18 | II | PA.D.INT | 17 | 30 | 23 | III | OC.D.EXT | 1 | 27 | 45 | II | PA.D.EXT | | |
| | 9 | 44 | 17 | II | OM.F.EXT | 17 | 40 | 6 | I | PA.D.EXT | 1 | 34 | 50 | II | OM.F.INT | | |
| | 10 | 17 | 13 | I | PA.D.EXT | 17 | 40 | 43 | III | OC.D.INT | 1 | 39 | 9 | II | OM.F.EXT | | |
| | 10 | 20 | 55 | I | PA.D.INT | 17 | 43 | 47 | I | PA.D.INT | 2 | 4 | 9 | I | OM.F.INT | | |
| | 11 | 14 | 7 | I | OM.F.INT | 18 | 39 | 8 | I | OM.F.INT | 2 | 7 | 52 | I | OM.F.EXT | | |
| | 11 | 17 | 49 | I | OM.F.EXT | 18 | 42 | 50 | I | OM.F.EXT | 3 | 14 | 46 | I | PA.F.INT | | |
| | 12 | 17 | 28 | II | PA.F.INT | 19 | 52 | 25 | I | PA.F.INT | 3 | 18 | 27 | I | PA.F.EXT | | |
| | 12 | 21 | 41 | II | PA.F.EXT | 19 | 56 | 6 | I | PA.F.EXT | 4 | 2 | 20 | II | PA.F.INT | | |
| | 12 | 29 | 27 | I | PA.F.INT | 20 | 10 | 42 | II | OC.F.INT | 4 | 6 | 33 | II | PA.F.EXT | | |
| | 12 | 33 | 9 | I | PA.F.EXT | 20 | 14 | 49 | II | OC.F.EXT | | | | I | EC.D.PEN | | |
| | | | | | | 20 | 27 | 41 | III | OC.F.INT | 21 | 3 | 32 | I | EC.D.EXT | | |
| 18 | 6 | 12 | 34 | I | EC.D.PEN | 20 | 38 | 1 | III | OC.F.EXT | 21 | 4 | 18 | I | EC.D.EXT | | |
| | 6 | 13 | 20 | I | EC.D.EXT | | | | | | 21 | 8 | 2 | I | EC.D.INT | | |
| | 6 | 17 | 5 | I | EC.D.INT | 23 | 13 | 37 | 58 | I | EC.D.PEN | | | | | | |
| | 9 | 44 | 53 | I | OC.F.INT | 13 | 38 | 45 | I | EC.D.EXT | 29 | 0 | 30 | 49 | I | OC.F.INT | |
| | 9 | 48 | 37 | I | OC.F.EXT | 13 | 42 | 29 | I | EC.D.INT | 0 | 34 | 32 | I | OC.F.EXT | | |
| | 22 | 27 | 53 | III | OM.D.EXT | 17 | 8 | 7 | I | OC.F.INT | 16 | 24 | 44 | III | EC.D.PEN | | |
| | 22 | 38 | 26 | III | OM.D.INT | 17 | 11 | 50 | I | OC.F.EXT | 16 | 28 | 33 | III | EC.D.EXT | | |
| | | | | | | | | | | | 16 | 39 | 21 | III | EC.D.INT | | |
| 19 | 1 | 20 | 16 | III | OM.F.INT | 24 | 9 | 39 | 41 | II | OM.D.EXT | 17 | 38 | 39 | II | EC.D.PEN | |
| | 1 | 30 | 54 | III | OM.F.EXT | | 9 | 43 | 59 | II | OM.D.INT | 17 | 40 | 16 | II | EC.D.EXT | |
| | 1 | 48 | 31 | II | EC.D.PEN | 10 | 54 | 55 | I | OM.D.EXT | 17 | 44 | 30 | II | EC.D.INT | | |
| | 1 | 50 | 9 | II | EC.D.EXT | 10 | 58 | 38 | I | OM.D.INT | 18 | 19 | 49 | I | OM.D.EXT | | |
| | 1 | 54 | 24 | II | EC.D.INT | 12 | 7 | 36 | I | PA.D.EXT | 18 | 23 | 31 | I | OM.D.INT | | |
| | 3 | 30 | 1 | I | OM.D.EXT | 12 | 9 | 35 | II | PA.D.EXT | 19 | 17 | 2 | III | EC.F.INT | | |
| | 3 | 33 | 43 | I | OM.D.INT | 12 | 11 | 17 | I | PA.D.INT | 19 | 27 | 50 | III | EC.F.EXT | | |
| | 3 | 34 | 50 | III | PA.D.EXT | 12 | 13 | 48 | II | PA.D.INT | 19 | 29 | 38 | I | PA.D.EXT | | |
| | 3 | 45 | 9 | III | PA.D.INT | 12 | 16 | 49 | II | OM.F.INT | 19 | 31 | 39 | III | EC.F.PEN | | |
| | 4 | 44 | 54 | I | PA.D.EXT | 12 | 21 | 8 | II | OM.F.EXT | 19 | 33 | 19 | I | PA.D.EXT | | |
| | 4 | 48 | 36 | I | PA.D.INT | 13 | 7 | 29 | I | OM.F.INT | 20 | 32 | 31 | I | OM.F.INT | | |
| | 5 | 42 | 27 | I | OM.F.INT | 13 | 11 | 12 | I | OM.F.EXT | 20 | 36 | 14 | I | OM.F.EXT | | |
| | 5 | 46 | 9 | I | OM.F.EXT | 14 | 19 | 57 | I | PA.F.INT | 21 | 13 | 53 | III | OC.D.EXT | | |
| | 6 | 29 | 13 | III | PA.F.EXT | 14 | 23 | 38 | I | PA.F.EXT | 21 | 24 | 11 | III | OC.D.INT | | |
| | 6 | 39 | 29 | III | PA.F.EXT | 14 | 48 | 15 | II | PA.F.INT | 21 | 42 | 5 | I | PA.F.EXT | | |
| | 6 | 56 | 48 | II | OC.F.INT | 14 | 52 | 28 | II | PA.F.EXT | 21 | 45 | 47 | I | PA.F.EXT | | |
| | 6 | 57 | 10 | I | PA.F.INT | 19 | 35 | 48 | IV | OC.D.EXT | 22 | 36 | 46 | II | OC.F.INT | | |
| | 7 | 0 | 51 | I | PA.F.EXT | 21 | 21 | 39 | IV | OC.F.EXT | 22 | 40 | 53 | II | OC.F.EXT | | |
| | 7 | 0 | 56 | II | OC.F.EXT | | | | | | | | | | | | |
| 20 | 0 | 41 | 1 | I | EC.D.PEN | 25 | 8 | 6 | 31 | I | EC.D.PEN | 30 | 0 | 11 | 35 | III | OC.F.INT |
| | 0 | 41 | 47 | I | EC.D.EXT | | 8 | 7 | 17 | I | EC.D.EXT | 0 | 21 | 53 | III | OC.F.EXT | |
| | 0 | 45 | 32 | I | EC.D.INT | 11 | 35 | 47 | I | OC.F.INT | 15 | 31 | 58 | I | EC.D.PEN | | |
| | 4 | 12 | 41 | I | OC.F.INT | 11 | 39 | 30 | I | OC.F.EXT | 15 | 32 | 44 | I | EC.D.EXT | | |
| | 4 | 16 | 24 | I | OC.F.EXT | | | | | | 15 | 36 | 28 | I | EC.D.INT | | |
| | 20 | 21 | 4 | II | OM.D.EXT | 26 | 2 | 26 | 43 | III | OM.D.EXT | 19 | 1 | 52 | I | OC.F.EXT | |
| | 20 | 25 | 22 | II | OM.D.INT | | 2 | 37 | 12 | III | OM.D.INT | 12 | 20 | 19 | II | OM.D.INT | |
| | 21 | 58 | 18 | I | OM.D.EXT | 4 | 21 | 56 | II | EC.D.PEN | 12 | 48 | 7 | I | OM.D.EXT | | |
| | 22 | 2 | 0 | I | OM.D.INT | 4 | 23 | 33 | II | EC.D.EXT | 12 | 51 | 49 | I | OM.D.INT | | |
| | 22 | 54 | 10 | II | PA.D.EXT | 4 | 27 | 48 | II | EC.D.INT | 13 | 56 | 51 | I | PA.D.EXT | | |
| | 22 | 57 | 55 | II | OM.F.INT | 5 | 20 | 9 | III | OM.F.INT | 14 | 0 | 32 | I | PA.D.INT | | |
| | 22 | 58 | 23 | II | PA.D.INT | 5 | 23 | 13 | I | OM.D.EXT | 14 | 37 | 44 | II | PA.D.EXT | | |
| | 23 | 2 | 14 | II | OM.F.EXT | 5 | 26 | 55 | I | OM.D.INT | 14 | 41 | 57 | II | PA.D.INT | | |
| | 23 | 12 | 31 | I | PA.D.EXT | 5 | 30 | 43 | III | OM.F.EXT | 14 | 53 | 44 | II | OM.F.INT | | |
| | 23 | 16 | 13 | I | PA.D.INT | 6 | 35 | 0 | I | PA.D.EXT | | | | | | | |
| | | | | | | 6 | 38 | 42 | I | PA.D.INT | 14 | 58 | 2 | II | OM.F.EXT | | |
| 21 | 0 | 10 | 46 | I | OM.F.INT | 7 | 20 | 38 | III | PA.D.EXT | 15 | 0 | 53 | I | OM.F.INT | | |
| | 0 | 14 | 29 | I | OM.F.EXT | 7 | 30 | 55 | III | PA.D.INT | 15 | 4 | 35 | I | OM.F.EXT | | |
| | 1 | 24 | 49 | I | PA.F.INT | 7 | 35 | 49 | I | OM.F.INT | 16 | 9 | 21 | I | PA.F.INT | | |
| | 1 | 28 | 30 | I | PA.F.EXT | 7 | 39 | 32 | I | OM.F.EXT | 16 | 13 | 2 | I | PA.F.EXT | | |
| | 1 | 32 | 42 | II | PA.F.INT | 8 | 47 | 24 | I | PA.F.INT | 17 | 16 | 40 | II | PA.F.EXT | | |
| | 1 | 36 | 54 | II | PA.F.EXT | 8 | 51 | 5 | I | PA.F.EXT | 17 | 20 | 52 | II | PA.F.EXT | | |
| | 19 | 9 | 33 | I | EC.D.PEN | 9 | 24 | 2 | II | OC.F.INT | | | | | | | |
| | 19 | 10 | 19 | I | EC.D.EXT | 9 | 28 | 10 | II | OC.F.EXT | | | | | | | |
| | 19 | 14 | 4 | I | EC.D.INT | 10 | 15 | 33 | III | PA.F.INT | | | | | | | |

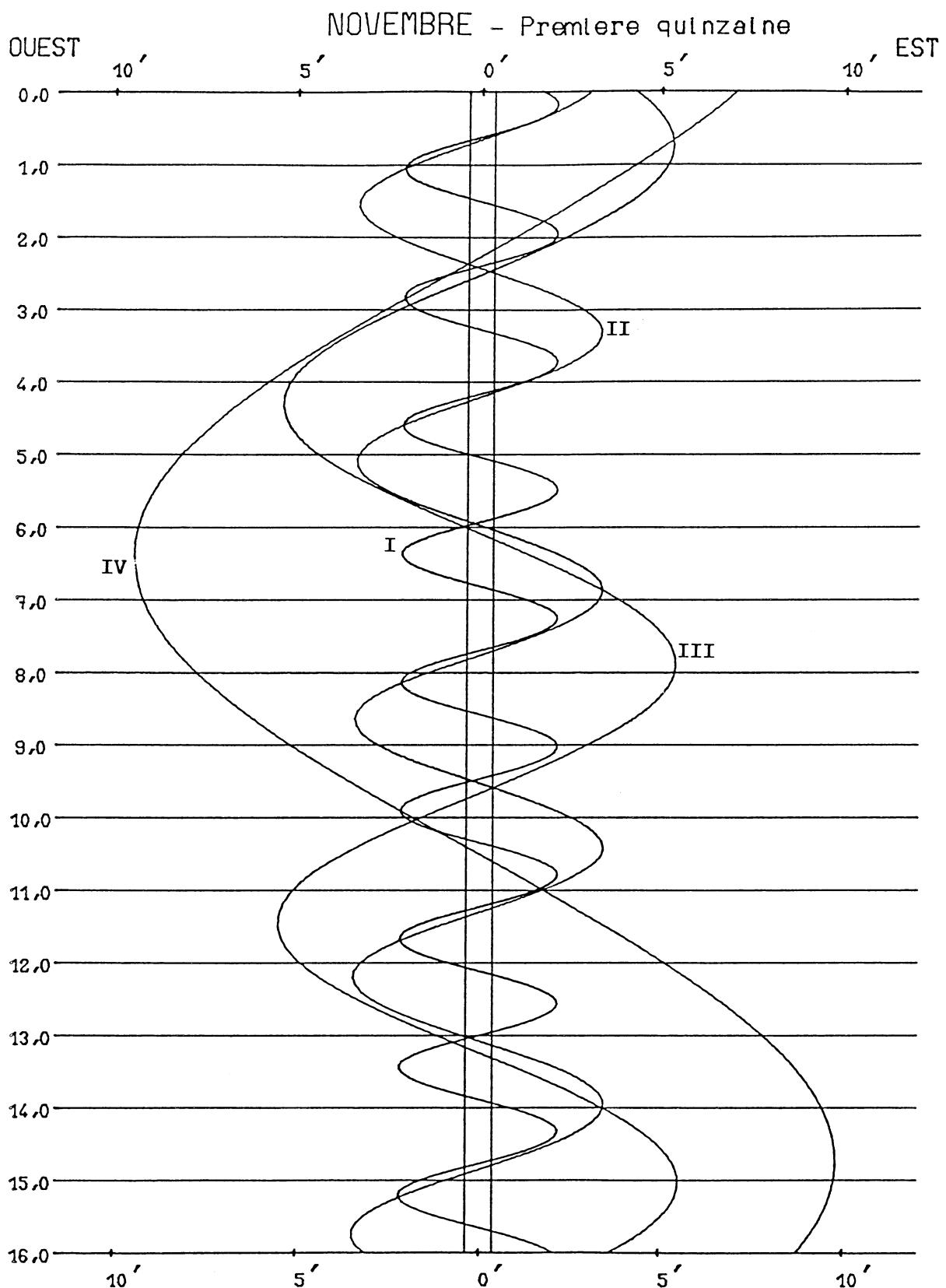


Dans le sens OUEST-EST, les satellites passent au-delà de Jupiter

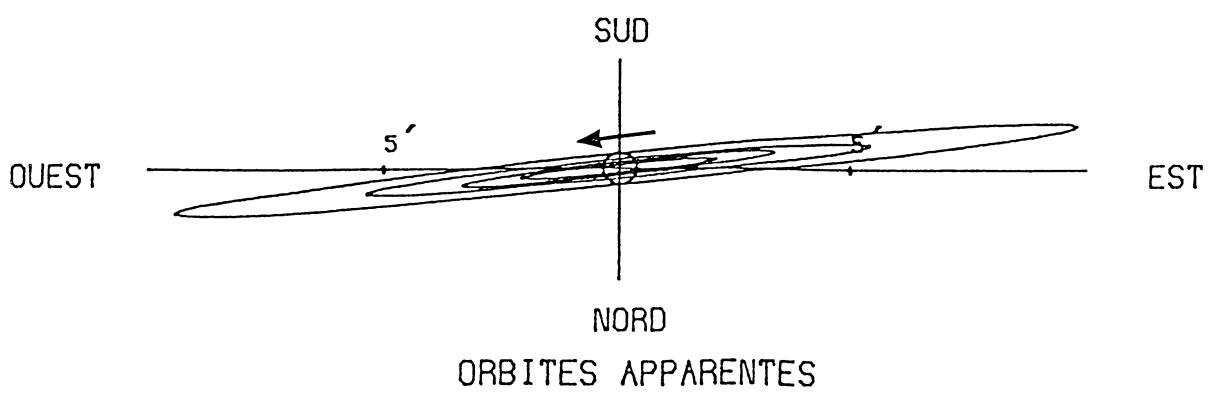


1989 - SATELLITES DE JUPITER -

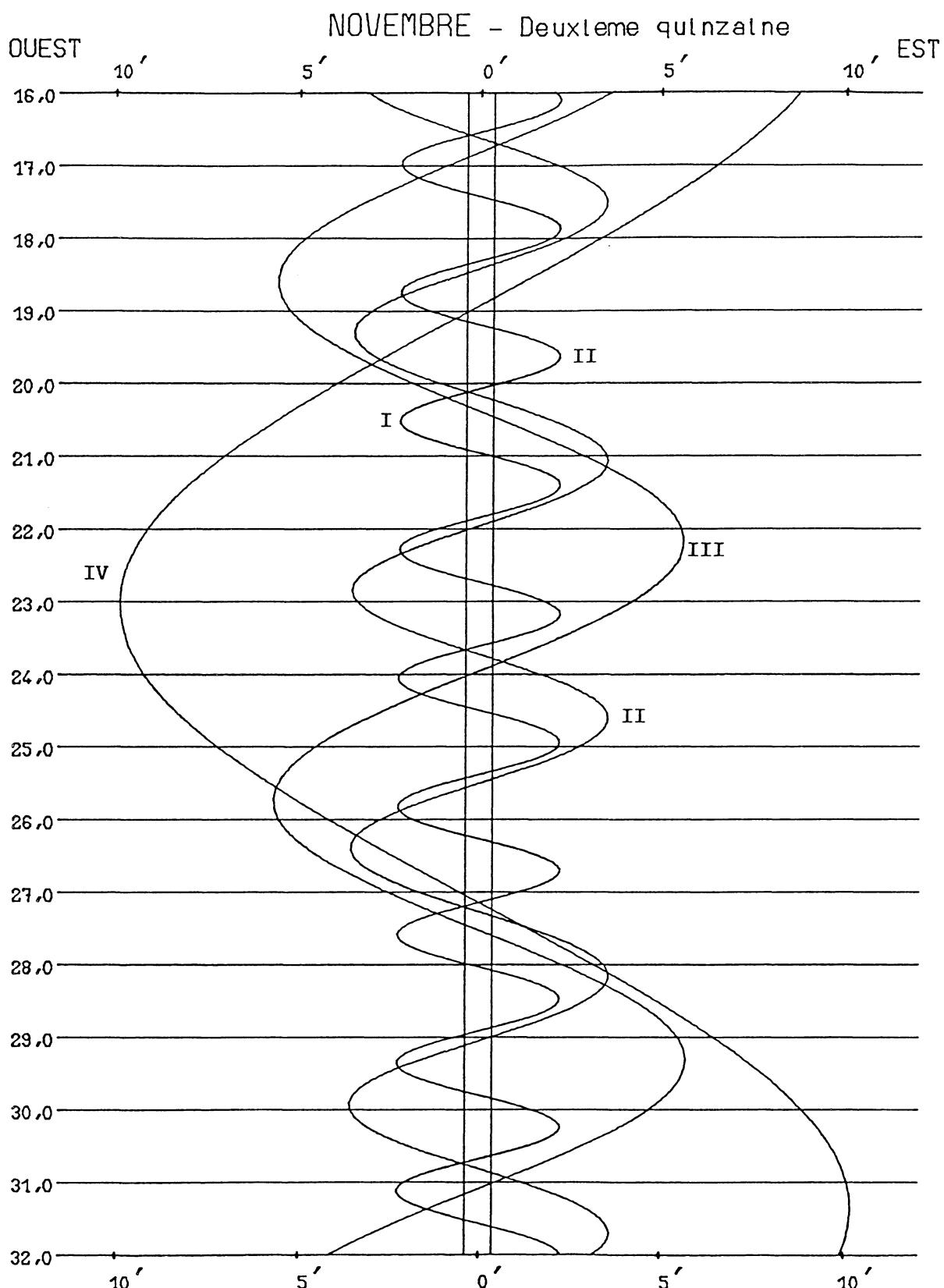
| PHENOMENES | | | | | | MOIS : | | | NOVEMBRE - PREMIERE QUINZAINE - | | | | | | | | | |
|------------|----|----|----|-----|----------|----------|----------|----|---------------------------------|----------|----------|----------|----------|----------|----|----------|----------|----------|
| JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE | |
| 1 | 10 | 0 | 31 | I | EC.D.PEN | 23 | 32 | 27 | III | EC.F.PEN | | 4 | 14 | 26 | II | OM.D.INT | | |
| | 10 | 1 | 17 | I | EC.D.EXT | 23 | 34 | 20 | I | PA.F.EXT | | 4 | 38 | 37 | I | PA.D.EXT | | |
| | 10 | 5 | 2 | I | EC.D.INT | 6 | 0 | 53 | 24 | III | OC.D.EXT | | 4 | 42 | 18 | I | PA.D.INT | |
| | 13 | 25 | 31 | I | OC.F.INT | | 1 | 0 | 33 | II | OC.F.INT | | 5 | 51 | 4 | I | OM.F.INT | |
| | 13 | 29 | 15 | I | OC.F.EXT | | 1 | 3 | 40 | III | OC.D.INT | | 5 | 54 | 46 | I | OM.F.EXT | |
| 2 | 5 | 30 | 32 | IV | PA.D.EXT | | 1 | 4 | 40 | II | OC.F.EXT | | 6 | 15 | 4 | II | PA.D.EXT | |
| | 6 | 24 | 48 | III | OM.D.EXT | | 3 | 51 | 24 | III | OC.F.INT | | 6 | 19 | 17 | II | PA.D.INT | |
| | 6 | 35 | 14 | III | OM.D.INT | | 4 | 1 | 40 | III | OC.F.EXT | | 6 | 48 | 44 | II | OM.F.INT | |
| | 6 | 55 | 23 | II | EC.D.PEN | 17 | 26 | 0 | I | EC.D.PEN | | 6 | 51 | 22 | I | PA.F.INT | | |
| | 6 | 57 | 0 | II | EC.D.EXT | 17 | 26 | 46 | I | EC.D.EXT | | 6 | 53 | 1 | II | OM.F.EXT | | |
| | 7 | 1 | 13 | II | EC.D.INT | 17 | 30 | 30 | I | EC.D.INT | | 8 | 54 | 20 | II | PA.F.INT | | |
| | 7 | 16 | 25 | I | OM.D.EXT | 20 | 47 | 1 | I | OC.F.INT | | 8 | 58 | 32 | II | PA.F.EXT | | |
| | 7 | 19 | 5 | IV | PA.F.EXT | 20 | 50 | 44 | I | OC.F.EXT | | 12 | 0 | 51 | 38 | I | EC.D.PEN | |
| | 7 | 20 | 7 | I | OM.D.INT | I | OM.D.EXT | | 0 | 52 | 24 | | I | EC.D.EXT | | | | |
| | 8 | 23 | 58 | I | PA.D.EXT | 14 | 45 | 2 | I | OM.D.INT | | 0 | 56 | 8 | I | EC.D.INT | | |
| | 8 | 27 | 40 | I | PA.D.INT | 14 | 52 | 23 | II | OM.D.INT | | 4 | 7 | 59 | I | OC.F.INT | | |
| | 9 | 19 | 20 | III | OM.F.INT | 14 | 56 | 40 | II | OM.D.INT | | 4 | 11 | 43 | I | OC.F.EXT | | |
| | 9 | 29 | 14 | I | OM.F.INT | 15 | 44 | 58 | I | PA.D.EXT | | 22 | 6 | 16 | I | OM.D.EXT | | |
| | 9 | 29 | 50 | III | OM.F.EXT | 15 | 48 | 40 | I | PA.D.INT | | 22 | 9 | 58 | I | OM.D.INT | | |
| | 9 | 32 | 56 | I | OM.F.EXT | 16 | 54 | 20 | I | OM.F.INT | | 22 | 45 | 36 | II | EC.D.PEN | | |
| | 10 | 36 | 31 | I | PA.F.INT | 16 | 58 | 2 | I | OM.F.EXT | | 22 | 47 | 13 | II | EC.D.EXT | | |
| | 10 | 40 | 12 | I | PA.F.EXT | 17 | 3 | 29 | II | PA.D.EXT | | 22 | 51 | 26 | II | EC.D.INT | | |
| | 11 | 1 | 1 | III | PA.D.EXT | 17 | 7 | 42 | II | PA.D.INT | | 23 | 5 | 21 | I | PA.D.EXT | | |
| | 11 | 11 | 16 | III | PA.D.INT | 17 | 30 | 40 | II | OM.F.INT | | 23 | 9 | 2 | I | PA.D.INT | | |
| | 11 | 48 | 57 | II | OC.F.INT | 17 | 34 | 57 | II | OM.F.EXT | | 13 | 0 | 19 | 27 | I | OM.F.INT | |
| | 11 | 53 | 5 | II | OC.F.EXT | 17 | 57 | 39 | I | PA.F.INT | | | 0 | 23 | 9 | I | OM.F.EXT | |
| | 13 | 56 | 25 | III | PA.F.INT | 18 | 1 | 20 | I | PA.F.EXT | | | 0 | 23 | 50 | III | EC.D.PEN | |
| | 14 | 6 | 37 | III | PA.F.EXT | 19 | 42 | 38 | II | PA.F.INT | | | 0 | 27 | 37 | III | EC.D.EXT | |
| | 3 | 4 | 28 | 59 | I | EC.D.PEN | 19 | 46 | 50 | II | PA.F.EXT | | | 0 | 38 | 16 | III | EC.D.INT |
| | | 4 | 29 | 45 | I | EC.D.EXT | 8 | 11 | 54 | 34 | I | EC.D.PEN | | 1 | 18 | 8 | I | PA.F.INT |
| | | 4 | 33 | 30 | I | EC.D.INT | | 11 | 55 | 20 | I | EC.D.EXT | | 1 | 21 | 49 | I | PA.F.EXT |
| | | 7 | 52 | 44 | I | OC.F.INT | | 11 | 59 | 5 | I | EC.D.INT | | 3 | 18 | 8 | III | EC.F.INT |
| | 4 | 7 | 56 | 27 | I | OC.F.EXT | | 15 | 14 | 6 | I | OC.F.INT | | 3 | 22 | 1 | II | OC.F.INT |
| | | 1 | 33 | 46 | II | OM.D.EXT | | 15 | 17 | 49 | I | OC.F.EXT | | 3 | 26 | 8 | II | OC.F.EXT |
| | | 1 | 38 | 3 | II | OM.D.INT | | 3 | 28 | 47 | III | EC.F.EXT | | | | | | |
| | | 1 | 44 | 42 | I | OM.D.EXT | | 3 | 32 | 34 | III | EC.F.PEN | | | | | | |
| | | 1 | 48 | 24 | I | OM.D.INT | | 4 | 27 | 22 | III | OC.D.EXT | | | | | | |
| | | 2 | 51 | 2 | I | PA.D.EXT | | 4 | 37 | 37 | III | OC.D.INT | | | | | | |
| | | 2 | 54 | 43 | I | PA.D.INT | | 7 | 25 | 34 | III | OC.F.INT | | | | | | |
| | | 3 | 50 | 28 | II | PA.D.EXT | | 7 | 35 | 49 | III | OC.F.EXT | | | | | | |
| | | 3 | 54 | 41 | II | PA.D.INT | | 10 | 11 | 49 | I | EC.D.PEN | | | | | | |
| | | 3 | 57 | 35 | I | OM.F.INT | | 10 | 15 | 31 | I | EC.D.EXT | | | | | | |
| | | 4 | 1 | 17 | I | OM.F.EXT | | 10 | 22 | 44 | III | OM.D.INT | | | | | | |
| | | 4 | 11 | 45 | II | OM.F.INT | | 10 | 33 | 6 | III | OM.D.INT | | | | | | |
| | | 4 | 16 | 3 | II | OM.F.EXT | | 11 | 22 | 42 | I | OM.F.INT | | | | | | |
| | | 5 | 3 | 37 | I | PA.F.INT | | 11 | 26 | 24 | I | OM.F.EXT | | | | | | |
| | | 5 | 7 | 18 | I | PA.F.EXT | | 12 | 24 | 32 | I | PA.F.INT | | | | | | |
| | | 6 | 29 | 31 | II | PA.F.INT | | 12 | 28 | 13 | I | PA.F.EXT | | | | | | |
| | | 6 | 33 | 44 | II | PA.F.EXT | | 13 | 18 | 24 | III | OM.F.INT | | | | | | |
| | 5 | 22 | 57 | 33 | I | EC.D.PEN | | 13 | 28 | 51 | III | OM.F.EXT | | | | | | |
| | | 22 | 58 | 19 | I | EC.D.EXT | | 14 | 11 | 34 | II | OC.F.INT | | | | | | |
| | | 23 | 2 | 4 | I | EC.D.INT | | 14 | 15 | 41 | II | OC.F.EXT | | | | | | |
| | | 20 | 12 | 7 | II | EC.D.PEN | | 14 | 36 | 30 | III | PA.D.EXT | | | | | | |
| | | 20 | 13 | 1 | I | OM.D.EXT | | 14 | 46 | 43 | III | PA.D.INT | | | | | | |
| | | 20 | 13 | 44 | II | EC.D.EXT | | 17 | 32 | 21 | III | PA.F.INT | | | | | | |
| | | 20 | 16 | 43 | I | OM.D.INT | | 17 | 42 | 32 | III | PA.F.EXT | | | | | | |
| | | 20 | 17 | 57 | II | EC.D.INT | | 17 | 28 | 49 | II | OM.D.EXT | | | | | | |
| | | 20 | 24 | 38 | III | EC.D.PEN | | 17 | 32 | 1 | I | PA.D.EXT | | | | | | |
| | | 20 | 28 | 25 | III | EC.D.EXT | | 17 | 33 | 5 | II | OM.D.INT | | | | | | |
| | 10 | 20 | 39 | 9 | III | EC.D.INT | | 17 | 35 | 43 | I | PA.D.INT | | | | | | |
| | | 21 | 18 | 2 | I | PA.D.EXT | | 18 | 47 | 51 | I | OM.F.INT | | | | | | |
| | | 21 | 21 | 43 | I | PA.D.INT | | 18 | 51 | 33 | I | OM.F.EXT | | | | | | |
| | | 22 | 25 | 57 | I | OM.F.INT | | 19 | 26 | 57 | II | PA.D.EXT | | | | | | |
| | | 22 | 29 | 39 | I | OM.F.EXT | | 19 | 31 | 9 | II | PA.D.INT | | | | | | |
| | | 23 | 17 | 55 | III | EC.F.INT | | 19 | 44 | 52 | I | PA.F.INT | | | | | | |
| | | 23 | 28 | 39 | III | EC.F.EXT | | 19 | 48 | 33 | I | PA.F.EXT | | | | | | |
| | | 23 | 30 | 39 | I | PA.F.INT | | 20 | 7 | 41 | II | OM.F.INT | | | | | | |
| | | 11 | 11 | 3 | 37 | 57 | | 20 | 11 | 58 | II | OM.F.EXT | | | | | | |
| | | | 12 | 31 | 17 | IV | | 22 | 6 | 17 | II | PA.F.INT | | | | | | |
| | | | 12 | 54 | 40 | IV | | 22 | 10 | 29 | II | PA.F.EXT | | | | | | |
| | | | 13 | 39 | 27 | IV | | 15 | 13 | 48 | 41 | I | EC.D.PEN | | | | | |



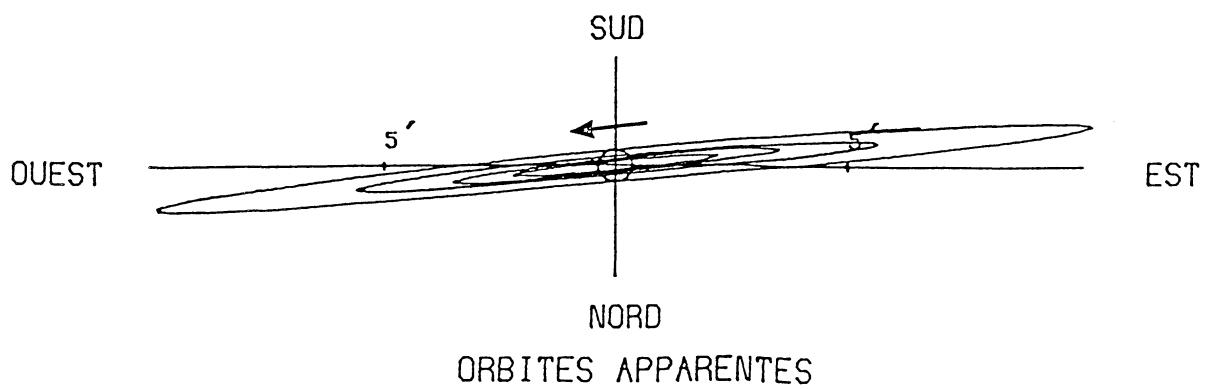
Dans le sens OUEST-EST, les satellites passent au-delà de Jupiter



| PHENOMENES | | | | | MOIS : | | | NOVEMBRE - DEUXIEME QUINZAINE - | | | | | | | | | |
|------------|----|----|----|-----|----------|------|----|---------------------------------|----|----------|----------|------|----|----|----|----------|----------|
| JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE |
| 16 | 11 | 2 | 55 | I | OM.D.EXT | 21 | 14 | 16 | I | EC.D.PEN | | 7 | 44 | 34 | I | OC.F.EXT | |
| | 11 | 6 | 37 | I | OM.D.INT | 21 | 15 | 2 | I | EC.D.EXT | | 20 | 0 | 56 | IV | EC.D.PEN | |
| | 11 | 58 | 36 | I | PA.D.EXT | 21 | 18 | 46 | I | EC.D.INT | | 20 | 28 | 10 | IV | EC.F.EXT | |
| | 12 | 2 | 18 | I | PA.D.INT | | | | | | | 21 | 50 | 32 | IV | EC.F.PEN | |
| | 12 | 2 | 23 | II | EC.D.PEN | 21 | 0 | 21 | 26 | I | OC.F.INT | | | | | | |
| | 12 | 4 | 0 | II | EC.D.EXT | | 0 | 25 | 9 | I | OC.F.EXT | 27 | 1 | 52 | 59 | I | OM.D.EXT |
| | 12 | 8 | 12 | II | EC.D.INT | | 18 | 27 | 56 | I | OM.D.INT | | 1 | 56 | 41 | I | OM.D.INT |
| | 13 | 16 | 14 | I | OM.F.INT | | 18 | 31 | 38 | I | OM.D.INT | | 2 | 36 | 55 | I | PA.D.EXT |
| | 13 | 19 | 56 | I | OM.F.EXT | | 19 | 18 | 3 | I | PA.D.EXT | | 2 | 40 | 37 | I | PA.D.INT |
| | 14 | 11 | 30 | I | PA.F.INT | | 19 | 21 | 44 | I | PA.D.INT | | 3 | 0 | 25 | IV | OC.D.EXT |
| | 14 | 15 | 11 | I | PA.F.EXT | | 20 | 5 | 15 | II | OM.D.EXT | | 3 | 40 | 59 | IV | OC.D.INT |
| | 14 | 21 | 0 | III | OM.D.EXT | | 20 | 9 | 30 | II | OM.D.INT | | 3 | 52 | 54 | II | EC.D.PEN |
| | 14 | 31 | 20 | III | OM.D.INT | | 20 | 41 | 27 | I | OM.F.INT | | 3 | 54 | 30 | II | EC.D.EXT |
| | 16 | 31 | 57 | II | OC.F.INT | | 20 | 45 | 9 | I | OM.F.EXT | | 3 | 58 | 41 | II | EC.D.INT |
| | 16 | 36 | 4 | II | OC.F.EXT | | 21 | 31 | 4 | I | PA.F.INT | | 4 | 6 | 42 | I | OM.F.INT |
| | 17 | 17 | 52 | III | OM.F.INT | | 21 | 34 | 45 | I | PA.F.EXT | | 4 | 10 | 24 | I | OM.F.EXT |
| | 17 | 28 | 15 | III | OM.F.EXT | | 21 | 48 | 8 | II | PA.D.EXT | | 4 | 15 | 15 | IV | OC.F.EXT |
| | 18 | 7 | 44 | III | PA.D.EXT | | 21 | 52 | 20 | II | PA.D.INT | | 4 | 50 | 4 | I | PA.F.INT |
| | 18 | 17 | 56 | III | PA.D.INT | | 22 | 44 | 42 | II | OM.F.INT | | 4 | 53 | 46 | I | PA.F.EXT |
| | 21 | 3 | 58 | III | PA.F.INT | | 22 | 48 | 58 | II | OM.F.EXT | | 4 | 55 | 50 | IV | OC.F.EXT |
| | 21 | 14 | 9 | III | PA.F.EXT | | | | | | | | 7 | 58 | 41 | II | OC.F.INT |
| | | | | | | 22 | 0 | 27 | 37 | II | PA.F.INT | | 8 | 2 | 48 | II | OC.F.EXT |
| 17 | 8 | 17 | 11 | I | EC.D.PEN | | 0 | 31 | 49 | II | PA.F.EXT | | 8 | 22 | 13 | III | EC.D.PEN |
| | 8 | 17 | 57 | I | EC.D.EXT | | 15 | 42 | 52 | I | EC.D.PEN | | 8 | 25 | 57 | III | EC.D.EXT |
| | 8 | 21 | 41 | I | EC.D.INT | | 15 | 43 | 38 | I | EC.D.EXT | | 8 | 36 | 28 | III | EC.D.INT |
| | 11 | 28 | 14 | I | OC.F.INT | | 15 | 47 | 22 | I | EC.D.INT | | 11 | 18 | 26 | III | EC.F.INT |
| | 11 | 31 | 57 | I | OC.F.EXT | | 18 | 47 | 59 | I | OC.F.INT | | 11 | 21 | 34 | III | OC.D.EXT |
| | | | | | | | 18 | 51 | 42 | I | OC.F.EXT | | 11 | 28 | 58 | III | EC.F.EXT |
| 18 | 5 | 31 | 14 | I | OM.D.EXT | | | | | | | | 11 | 31 | 47 | III | OC.D.INT |
| | 5 | 34 | 56 | I | OM.D.INT | 23 | 12 | 56 | 16 | I | OM.D.EXT | | 11 | 32 | 41 | III | EC.F.PEN |
| | 6 | 25 | 8 | I | PA.D.EXT | | 12 | 59 | 58 | I | OM.D.INT | | 14 | 19 | 56 | III | OC.F.INT |
| | 6 | 28 | 49 | I | PA.D.INT | | 13 | 44 | 23 | I | PA.D.EXT | | 14 | 30 | 9 | III | OC.F.EXT |
| | 6 | 46 | 35 | II | OM.D.EXT | | 13 | 48 | 4 | I | PA.D.INT | | 23 | 8 | 31 | I | EC.D.PEN |
| | 6 | 50 | 51 | II | OM.D.INT | | 14 | 36 | 3 | II | EC.D.PEN | | 23 | 9 | 17 | I | EC.D.EXT |
| | 7 | 44 | 37 | I | OM.F.INT | | 14 | 37 | 39 | II | EC.D.EXT | | 23 | 13 | 1 | I | EC.D.INT |
| | 7 | 48 | 19 | I | OM.F.EXT | | 14 | 41 | 51 | II | EC.D.INT | | | | | | |
| | 8 | 37 | 22 | II | PA.D.EXT | | 15 | 9 | 51 | I | OM.F.INT | 28 | 2 | 7 | 7 | I | OC.F.INT |
| | 8 | 38 | 4 | I | PA.F.INT | | 15 | 13 | 33 | I | OM.F.EXT | | 2 | 10 | 50 | I | OC.F.EXT |
| | 8 | 41 | 35 | II | PA.D.INT | | 15 | 57 | 27 | I | PA.F.INT | | 20 | 21 | 23 | I | OM.D.EXT |
| | 8 | 41 | 45 | I | PA.F.EXT | | 16 | 1 | 8 | I | PA.F.EXT | | 20 | 25 | 4 | I | OM.D.INT |
| | 9 | 25 | 45 | II | OM.F.INT | | 18 | 19 | 28 | III | OM.D.EXT | | 21 | 3 | 8 | I | PA.D.EXT |
| | 9 | 30 | 1 | II | OM.F.EXT | | 18 | 29 | 45 | III | OM.D.INT | | 21 | 6 | 50 | I | PA.D.INT |
| | 11 | 16 | 48 | II | PA.F.INT | | 18 | 50 | 17 | II | OC.F.INT | | 22 | 35 | 9 | I | OM.F.INT |
| | 11 | 21 | 0 | II | PA.F.EXT | | 18 | 54 | 24 | II | OC.F.EXT | | 22 | 38 | 51 | I | OM.F.EXT |
| | 21 | 12 | 55 | IV | PA.D.EXT | | 21 | 17 | 30 | III | OM.F.INT | | 22 | 41 | 46 | II | OM.D.EXT |
| | 21 | 54 | 11 | IV | PA.D.INT | | 21 | 27 | 50 | III | OM.F.EXT | | 22 | 46 | 1 | II | OM.D.INT |
| | 22 | 25 | 9 | IV | PA.F.INT | | 21 | 34 | 38 | III | PA.D.EXT | | 23 | 16 | 20 | I | PA.F.INT |
| | 23 | 6 | 5 | IV | PA.F.EXT | | 21 | 44 | 50 | III | PA.D.INT | | 23 | 20 | 1 | I | PA.F.EXT |
| 19 | 2 | 45 | 47 | I | EC.D.PEN | 24 | 0 | 31 | 12 | III | PA.F.INT | 29 | 0 | 7 | 18 | II | PA.D.EXT |
| | 2 | 46 | 33 | I | EC.D.EXT | | 0 | 41 | 22 | III | PA.F.EXT | | 0 | 11 | 30 | II | PA.D.INT |
| | 2 | 50 | 17 | I | EC.D.INT | | 10 | 11 | 24 | I | EC.D.PEN | | 1 | 21 | 47 | II | OM.F.INT |
| | 5 | 54 | 55 | I | OC.F.INT | | 10 | 12 | 10 | I | EC.D.INT | | 1 | 26 | 2 | II | OM.F.EXT |
| | 5 | 58 | 38 | I | OC.F.EXT | | 10 | 15 | 54 | I | EC.D.INT | | 2 | 46 | 52 | II | PA.F.INT |
| | 23 | 59 | 35 | I | OM.D.EXT | | 13 | 14 | 24 | I | OC.F.INT | | 2 | 51 | 4 | II | PA.F.EXT |
| | | | | | | | 13 | 18 | 7 | I | OC.F.EXT | | 17 | 37 | 9 | I | EC.D.PEN |
| 20 | 0 | 3 | 17 | I | OM.D.INT | | | | | | | | 17 | 37 | 54 | I | EC.D.EXT |
| | 0 | 51 | 37 | I | PA.D.EXT | 25 | 7 | 24 | 37 | I | OM.D.EXT | | 17 | 41 | 38 | I | EC.D.INT |
| | 0 | 55 | 18 | I | PA.D.INT | | 7 | 28 | 19 | I | OM.D.INT | | 20 | 33 | 27 | I | OC.F.INT |
| | 1 | 19 | 13 | II | EC.D.PEN | | 8 | 10 | 41 | I | PA.D.EXT | | 20 | 37 | 10 | I | OC.F.EXT |
| | 1 | 20 | 49 | II | EC.D.EXT | | 8 | 14 | 22 | I | PA.D.INT | | | | | | |
| | 1 | 25 | 1 | II | EC.D.INT | | 9 | 23 | 3 | II | OM.D.EXT | 30 | 14 | 49 | 44 | I | OM.D.EXT |
| | 2 | 13 | 1 | I | OM.F.INT | | 9 | 27 | 18 | II | OM.D.INT | | 14 | 53 | 26 | I | OM.D.INT |
| | 2 | 16 | 43 | I | OM.F.EXT | | 9 | 38 | 16 | I | OM.F.INT | | 15 | 29 | 16 | I | PA.D.EXT |
| | 3 | 4 | 35 | I | PA.F.INT | | 9 | 41 | 58 | I | OM.F.EXT | | 15 | 32 | 57 | I | PA.D.INT |
| | 3 | 8 | 16 | I | PA.F.EXT | | 10 | 23 | 47 | I | PA.F.INT | | 17 | 3 | 35 | I | OM.F.INT |
| | 4 | 23 | 18 | III | EC.D.PEN | | 10 | 27 | 29 | I | PA.F.EXT | | 17 | 7 | 17 | I | OM.F.EXT |
| | 4 | 27 | 3 | III | EC.D.EXT | | 10 | 57 | 31 | II | PA.D.EXT | | 17 | 9 | 48 | II | EC.D.PEN |
| | 4 | 37 | 38 | III | EC.D.INT | | 11 | 1 | 43 | II | PA.D.INT | | 17 | 11 | 24 | II | EC.D.EXT |
| | 5 | 41 | 22 | II | OC.F.INT | | 12 | 2 | 48 | II | OM.F.INT | | 17 | 15 | 35 | II | EC.D.INT |
| | 5 | 45 | 29 | II | OC.F.EXT | | 12 | 7 | 3 | II | OM.F.EXT | | 17 | 42 | 30 | I | PA.F.INT |
| | 7 | 18 | 34 | III | EC.F.INT | | 13 | 37 | 4 | II | PA.F.INT | | 17 | 46 | 11 | I | PA.F.EXT |
| | 7 | 29 | 9 | III | EC.F.EXT | | 13 | 41 | 16 | II | PA.F.EXT | | 21 | 6 | 42 | II | OC.F.INT |
| | 7 | 32 | 54 | III | EC.F.PEN | | | | | | | | 21 | 10 | 49 | II | OC.F.EXT |
| | 7 | 56 | 53 | III | OC.D.EXT | 26 | 4 | 40 | 1 | I | EC.D.PEN | | 22 | 18 | 51 | III | OM.D.EXT |
| | 8 | 7 | 6 | III | OC.D.INT | | 4 | 40 | 47 | I | EC.D.EXT | | 22 | 29 | 6 | III | OM.D.INT |
| | 10 | 55 | 11 | III | OC.F.INT | | 4 | 44 | 31 | I | EC.D.INT | | | | | | |
| | 11 | 5 | 25 | III | OC.F.EXT | | 7 | 40 | 51 | I | OC.F.INT | | | | | | |

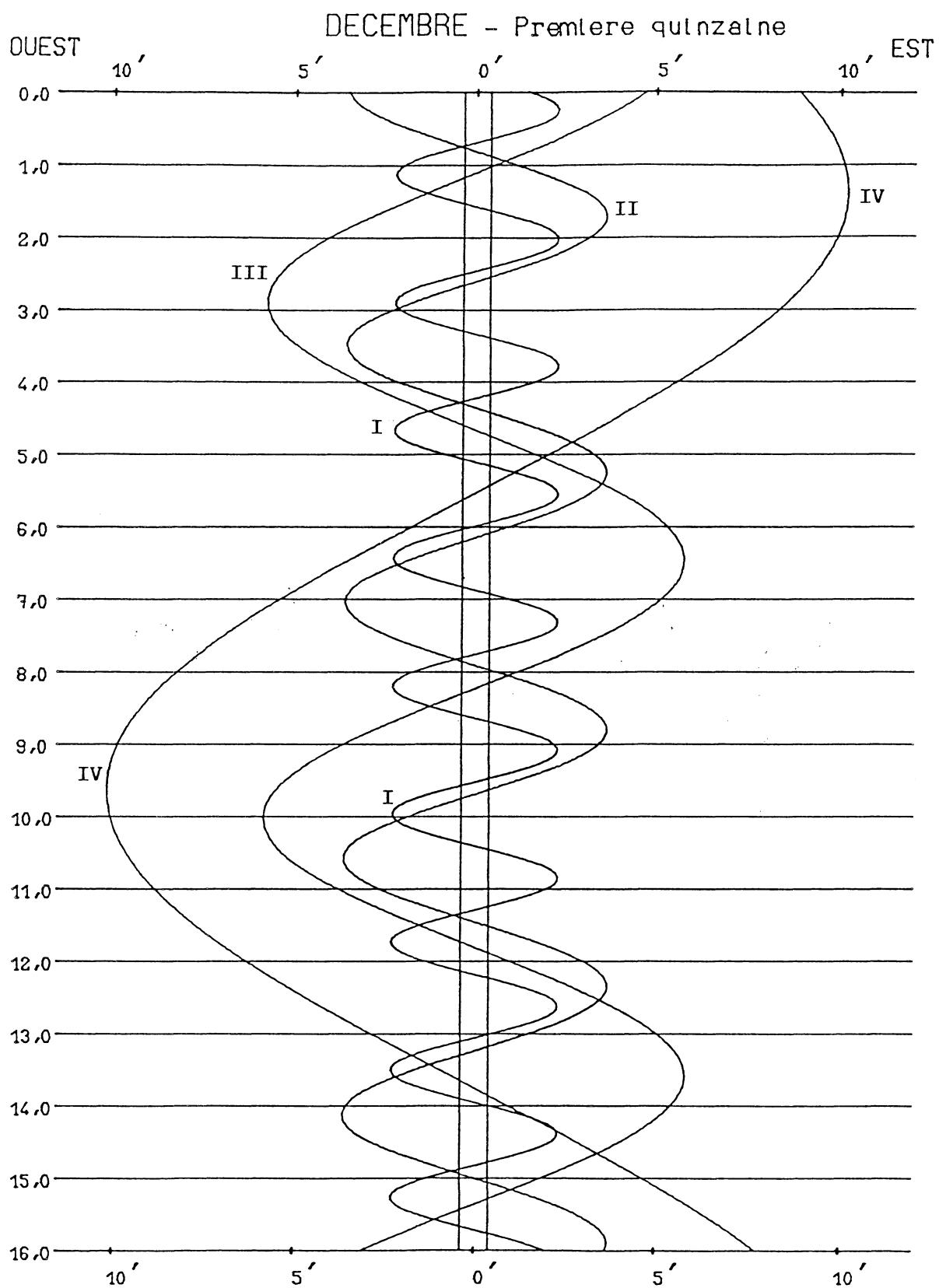


Dans le sens OUEST-EST, les satellites passent au-delà de Jupiter

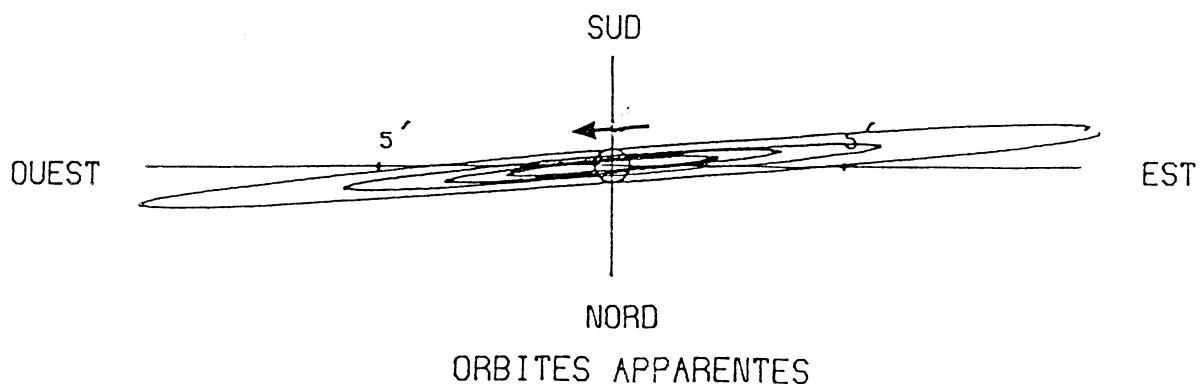


1989 - SATELLITES DE JUPITER -

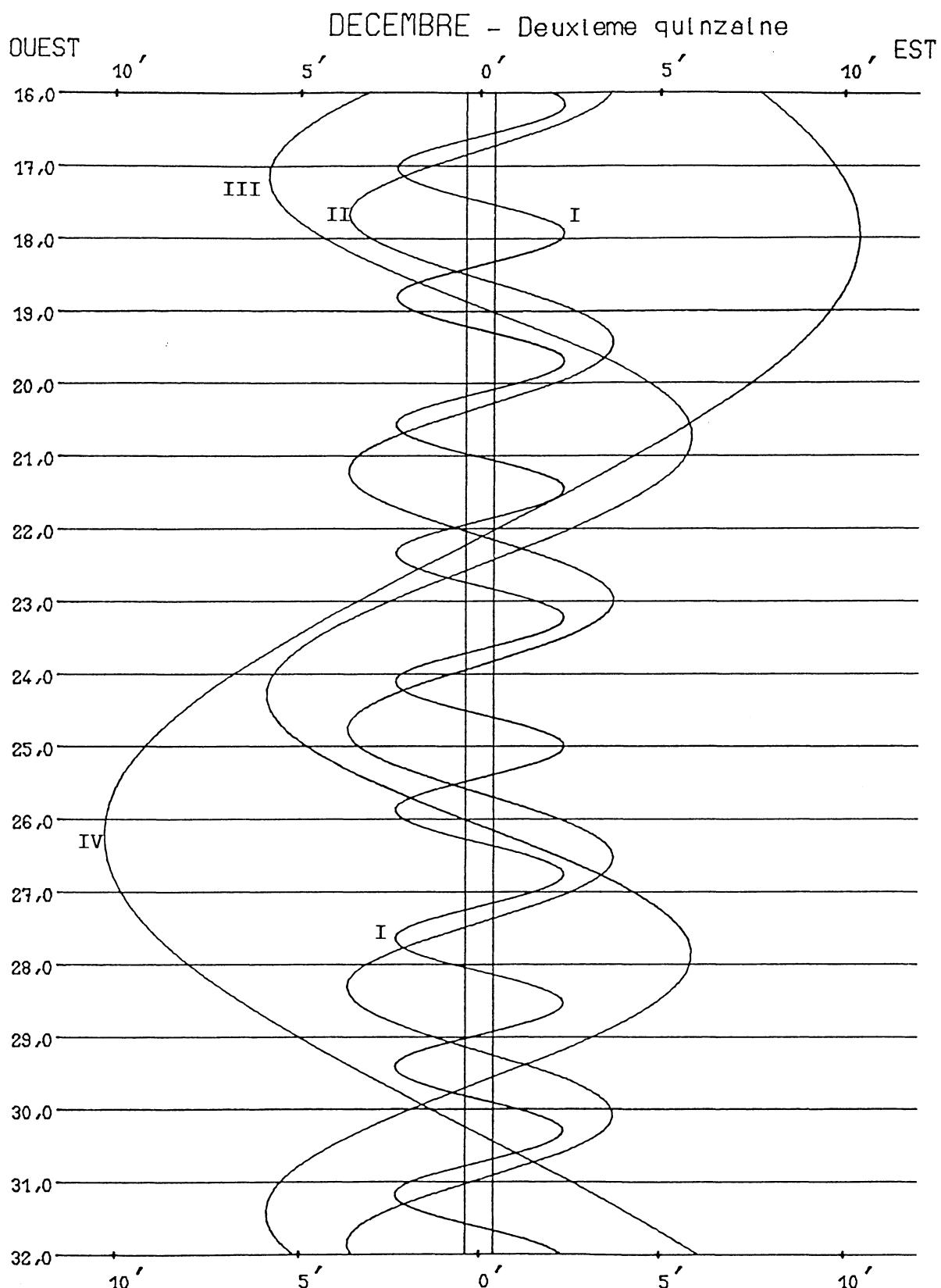
| PHENOMENES | | | | | | MOIS : | | | DECEMBRE - PREMIERE QUINZAINE - | | | | | | | | |
|------------|----|----|----|-----|----------|--------|----|----|---------------------------------|----------|----------|------|----|-----|----------|----------|------|
| JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE |
| 1 | 0 | 58 | 21 | III | PA.D.EXT | 1 | 4 | 29 | I | PA.F.EXT | 9 | 2 | 21 | II | EC.D.EXT | | |
| 1 | 8 | 31 | | III | PA.D.INT | 1 | 18 | 20 | II | OM.D.EXT | 9 | 6 | 31 | II | EC.D.INT | | |
| 1 | 18 | 3 | | III | OM.F.INT | 1 | 22 | 34 | II | OM.D.INT | 12 | 28 | 33 | II | OC.F.INT | | |
| 1 | 28 | 19 | | III | OM.F.EXT | 2 | 24 | 40 | II | PA.D.EXT | 12 | 32 | 40 | II | OC.F.EXT | | |
| 3 | 55 | 10 | | III | PA.F.INT | 2 | 28 | 52 | II | PA.D.INT | 16 | 20 | 26 | III | EC.D.PEN | | |
| 4 | 5 | 20 | | III | PA.F.EXT | 3 | 58 | 52 | II | OM.F.INT | 16 | 24 | 7 | III | EC.D.EXT | | |
| 12 | 5 | 41 | | I | EC.D.PEN | 4 | 3 | 7 | II | OM.F.EXT | 16 | 34 | 30 | III | EC.D.INT | | |
| 12 | 6 | 27 | | I | EC.D.EXT | 5 | 4 | 17 | II | PA.F.INT | 20 | 59 | 13 | III | OC.F.INT | | |
| 12 | 10 | 11 | | I | EC.D.INT | 5 | 8 | 29 | II | PA.F.EXT | 21 | 9 | 25 | III | OC.F.EXT | | |
| 14 | 59 | 39 | | I | OC.F.INT | 19 | 31 | 31 | I | EC.D.PEN | | | | | | | |
| 15 | 3 | 22 | | I | OC.F.EXT | 19 | 32 | 16 | I | EC.D.EXT | 12 | 2 | 57 | 18 | I | EC.D.PEN | |
| | | | | | | 19 | 36 | 0 | I | EC.D.INT | | 2 | 58 | 4 | I | EC.D.EXT | |
| 2 | 9 | 18 | 7 | I | OM.D.EXT | 22 | 18 | 7 | I | OC.F.INT | 3 | 1 | 48 | I | EC.D.INT | | |
| 9 | 21 | 49 | | I | OM.D.INT | 22 | 21 | 50 | I | OC.F.EXT | 5 | 36 | 11 | I | OC.F.INT | | |
| 9 | 55 | 22 | | I | PA.D.EXT | | | | | | 5 | 39 | 54 | I | OC.F.EXT | | |
| | 9 | 59 | 3 | I | PA.D.INT | 7 | 16 | 43 | 20 | I | OM.D.EXT | | | | | | |
| 11 | 32 | 2 | | I | OM.F.INT | 16 | 47 | 2 | I | OM.D.INT | 13 | 0 | 8 | 40 | I | OM.D.EXT | |
| 11 | 35 | 43 | | I | OM.F.EXT | 17 | 13 | 25 | I | PA.D.EXT | 0 | 12 | 21 | I | OM.D.INT | | |
| 11 | 59 | 37 | | II | OM.D.EXT | 17 | 17 | 6 | I | PA.D.INT | 0 | 31 | 11 | I | PA.D.EXT | | |
| 12 | 3 | 51 | | II | OM.D.INT | 18 | 57 | 26 | I | OM.F.INT | 0 | 34 | 53 | I | PA.D.INT | | |
| 12 | 8 | 38 | | I | PA.F.INT | 19 | 1 | 7 | I | OM.F.EXT | 2 | 22 | 55 | I | OM.F.INT | | |
| 12 | 12 | 20 | | I | PA.F.EXT | 19 | 26 | 48 | I | PA.F.INT | 2 | 26 | 37 | I | OM.F.EXT | | |
| 13 | 15 | 46 | | II | PA.D.EXT | 19 | 30 | 29 | I | PA.F.EXT | 2 | 44 | 40 | I | PA.F.INT | | |
| 13 | 19 | 58 | | II | PA.D.INT | 19 | 43 | 46 | II | EC.D.PEN | 2 | 48 | 21 | I | PA.F.EXT | | |
| 14 | 39 | 55 | | II | OM.F.INT | 19 | 45 | 21 | II | EC.D.EXT | 3 | 54 | 58 | II | OM.D.EXT | | |
| 14 | 44 | 9 | | II | OM.F.EXT | 19 | 49 | 32 | II | EC.D.INT | 3 | 59 | 12 | II | OM.D.INT | | |
| 15 | 55 | 23 | | II | PA.F.INT | 23 | 21 | 36 | II | OC.F.INT | 4 | 40 | 39 | II | PA.D.EXT | | |
| 15 | 59 | 35 | | II | PA.F.EXT | 23 | 25 | 43 | II | OC.F.EXT | 4 | 44 | 52 | II | PA.D.INT | | |
| | | | | | | | | | | | 6 | 36 | 0 | II | OM.F.INT | | |
| 3 | 6 | 34 | 20 | I | EC.D.PEN | 8 | 2 | 17 | 43 | III | OM.D.EXT | 6 | 40 | 13 | II | OM.F.EXT | |
| 6 | 35 | 6 | | I | EC.D.EXT | 2 | 27 | 54 | III | OM.D.INT | 7 | 20 | 16 | II | PA.F.INT | | |
| 6 | 38 | 50 | | I | EC.D.INT | 4 | 18 | 0 | III | PA.D.EXT | 7 | 24 | 28 | II | PA.F.EXT | | |
| 9 | 25 | 53 | | I | OC.F.INT | 4 | 28 | 10 | III | PA.D.INT | 13 | 58 | 40 | IV | EC.D.PEN | | |
| 9 | 29 | 36 | | I | OC.F.EXT | 5 | 18 | 2 | III | OM.F.INT | 14 | 19 | 27 | IV | EC.D.EXT | | |
| | | | | | | 5 | 28 | 15 | III | OM.F.EXT | 15 | 46 | 6 | IV | EC.F.EXT | | |
| 4 | 3 | 46 | 31 | I | OM.D.EXT | 7 | 15 | 2 | III | PA.F.INT | 16 | 6 | 54 | IV | EC.F.PEN | | |
| 3 | 50 | 13 | | I | OM.D.INT | 7 | 25 | 12 | III | PA.F.EXT | 17 | 27 | 55 | IV | OC.D.EXT | | |
| 4 | 21 | 25 | | I | PA.D.EXT | 14 | 0 | 5 | I | EC.D.PEN | 18 | 7 | 41 | IV | OC.D.INT | | |
| 4 | 25 | 6 | | I | PA.D.INT | 14 | 0 | 51 | I | EC.D.EXT | 18 | 43 | 59 | IV | OC.F.INT | | |
| 6 | 0 | 29 | | I | OM.F.INT | 14 | 4 | 34 | I | EC.D.INT | 19 | 23 | 45 | IV | OC.F.EXT | | |
| 6 | 4 | 11 | | I | OM.F.EXT | 16 | 44 | 9 | I | OC.F.INT | 21 | 25 | 59 | I | EC.D.PEN | | |
| 6 | 26 | 44 | | II | EC.D.PEN | 16 | 47 | 52 | I | OC.F.EXT | 21 | 26 | 44 | I | EC.D.EXT | | |
| 6 | 28 | 20 | | II | EC.D.EXT | | | | | | 21 | 30 | 28 | I | EC.D.INT | | |
| | 6 | 32 | 30 | II | EC.D.INT | 9 | 11 | 11 | 45 | I | OM.D.EXT | | | | | | |
| 6 | 34 | 44 | | I | PA.F.INT | 11 | 15 | 27 | I | OM.D.INT | 14 | 0 | 2 | 12 | I | OC.F.INT | |
| 6 | 38 | 25 | | I | PA.F.EXT | 11 | 39 | 22 | I | PA.D.EXT | 0 | 5 | 55 | I | OC.F.EXT | | |
| 10 | 14 | 17 | | II | OC.F.INT | 11 | 43 | 3 | I | PA.D.INT | 18 | 37 | 6 | I | OM.D.EXT | | |
| 10 | 18 | 24 | | II | OC.F.EXT | 13 | 25 | 54 | I | OM.F.INT | 18 | 40 | 48 | I | OM.D.INT | | |
| 12 | 21 | 8 | | III | EC.D.PEN | 13 | 29 | 36 | I | OM.F.EXT | 18 | 57 | 2 | I | PA.D.EXT | | |
| 12 | 24 | 51 | | III | EC.D.EXT | 13 | 52 | 46 | I | PA.F.INT | 19 | 0 | 43 | I | PA.D.INT | | |
| 12 | 35 | 18 | | III | EC.D.INT | 13 | 56 | 28 | I | PA.F.EXT | 20 | 51 | 25 | I | OM.F.INT | | |
| 17 | 40 | 54 | | III | OC.F.INT | 14 | 36 | 13 | II | OM.D.EXT | 20 | 55 | 6 | I | OM.F.EXT | | |
| 17 | 51 | 7 | | III | OC.F.EXT | 14 | 40 | 27 | II | OM.D.INT | 21 | 10 | 32 | I | PA.F.INT | | |
| | | | | | | 15 | 32 | 24 | II | PA.D.EXT | 21 | 14 | 13 | I | PA.F.EXT | | |
| 5 | 1 | 2 | 52 | I | EC.D.PEN | 15 | 36 | 36 | II | PA.D.INT | 22 | 17 | 51 | II | EC.D.PEN | | |
| 1 | 3 | 38 | | I | EC.D.EXT | 17 | 17 | 2 | II | OM.F.INT | 22 | 19 | 27 | II | EC.D.EXT | | |
| 1 | 7 | 21 | | I | EC.D.INT | 17 | 21 | 15 | II | OM.F.EXT | 22 | 23 | 36 | II | EC.D.INT | | |
| 3 | 51 | 58 | | I | OC.F.INT | 18 | 12 | 2 | II | PA.F.INT | | | | | | | |
| 3 | 55 | 41 | | I | OC.F.EXT | 18 | 16 | 14 | II | PA.F.EXT | 15 | 1 | 35 | 19 | II | OC.F.INT | |
| 6 | 47 | 2 | | IV | OM.D.EXT | | | | | | 1 | 39 | 27 | II | OC.F.EXT | | |
| 7 | 25 | 1 | | IV | OM.D.INT | 10 | 8 | 28 | 45 | I | EC.D.PEN | 6 | 17 | 0 | III | OM.D.EXT | |
| 8 | 6 | 24 | | IV | OM.F.INT | 8 | 29 | 31 | I | EC.D.EXT | 6 | 27 | 8 | III | OM.D.INT | | |
| 8 | 45 | 44 | | IV | OM.F.EXT | 8 | 33 | 14 | I | EC.D.INT | 7 | 35 | 21 | III | PA.D.EXT | | |
| 12 | 2 | 30 | | IV | PA.D.EXT | 11 | 10 | 15 | I | OC.F.INT | 7 | 45 | 31 | III | PA.D.INT | | |
| 12 | 42 | 24 | | IV | PA.D.INT | 11 | 13 | 58 | I | OC.F.EXT | 9 | 18 | 23 | III | OM.F.INT | | |
| 13 | 17 | 4 | | IV | PA.F.INT | | | | | | 9 | 28 | 32 | III | OM.F.EXT | | |
| 13 | 56 | 50 | | IV | PA.F.EXT | 11 | 5 | 40 | 11 | I | OM.D.EXT | 10 | 32 | 33 | III | PA.F.INT | |
| 22 | 14 | 56 | | I | OM.D.EXT | 5 | 43 | 53 | I | OM.D.INT | 10 | 42 | 43 | III | PA.F.EXT | | |
| 22 | 18 | 38 | | I | OM.D.INT | 6 | 5 | 16 | I | PA.D.EXT | 15 | 54 | 34 | I | EC.D.PEN | | |
| 22 | 47 | 27 | | I | PA.D.EXT | 6 | 8 | 58 | I | PA.D.INT | 15 | 55 | 20 | I | EC.D.EXT | | |
| 22 | 51 | 9 | | I | PA.D.INT | 7 | 54 | 23 | I | OM.F.INT | 15 | 59 | 3 | I | EC.D.INT | | |
| | | | | | | 7 | 58 | 5 | I | OM.F.EXT | 18 | 28 | 7 | I | OC.F.INT | | |
| 6 | 0 | 28 | 58 | I | OM.F.INT | 8 | 18 | 43 | I | PA.F.INT | 18 | 31 | 50 | I | OC.F.EXT | | |
| 0 | 32 | 40 | | I | OM.F.EXT | 8 | 22 | 24 | I | PA.F.EXT | | | | | | | |
| 1 | 0 | 48 | | I | PA.F.INT | 9 | 0 | 45 | II | EC.D.PEN | | | | | | | |



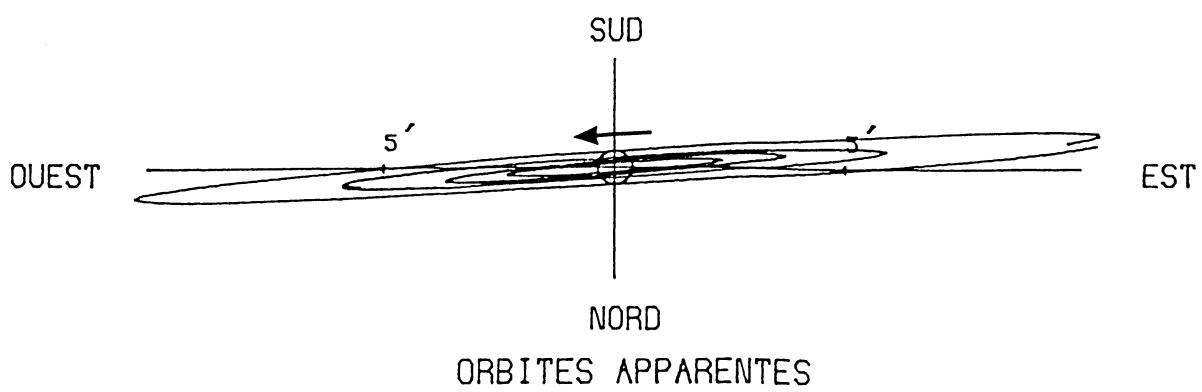
Dans le sens OUEST-EST, les satellites passent au-delà de Jupiter



| PHENOMENES | | | | | MOIS : | | | DECEMBRE - DEUXIEME QUINZAINE - | | | | | | | | | |
|------------|----|----|----|-----|----------|------|----|---------------------------------|-----|----------|----------|------|----|----|----------|----------|----------|
| JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE | JOUR | H | M | S | SAT | TYPE |
| 16 | 13 | 5 | 34 | I | OM.D.EXT | 0 | 57 | 54 | II | EC.D.INT | 9 | 12 | 42 | II | OM.D.INT | | |
| | 13 | 9 | 15 | I | OM.D.INT | 1 | 12 | 59 | IV | OM.D.INT | 9 | 14 | 29 | II | PA.D.INT | | |
| | 13 | 22 | 53 | I | PA.D.EXT | 2 | 15 | 57 | IV | PA.D.EXT | 11 | 49 | 43 | II | PA.F.INT | | |
| | 13 | 26 | 34 | I | PA.D.INT | 2 | 30 | 56 | IV | OM.F.INT | 11 | 50 | 18 | II | OM.F.INT | | |
| | 15 | 19 | 56 | I | OM.F.INT | 2 | 56 | 11 | IV | PA.D.INT | 11 | 53 | 55 | II | PA.F.EXT | | |
| | 15 | 23 | 37 | I | OM.F.EXT | 3 | 0 | 4 | IV | OM.F.EXT | 11 | 54 | 30 | II | OM.F.EXT | | |
| | 15 | 36 | 24 | I | PA.F.INT | 3 | 29 | 51 | IV | PA.F.INT | | | | I | OC.D.EXT | | |
| | 15 | 40 | 5 | I | PA.F.EXT | 3 | 48 | 20 | II | OC.F.INT | 28 | 1 | 14 | 58 | I | OC.D.EXT | |
| | 17 | 12 | 57 | II | OM.D.EXT | 3 | 52 | 28 | II | OC.F.EXT | | 1 | 18 | 41 | I | OC.D.INT | |
| | 17 | 17 | 10 | II | OM.D.INT | 4 | 10 | 4 | IV | PA.F.EXT | | 3 | 29 | 59 | I | EC.F.INT | |
| | 17 | 47 | 54 | II | PA.D.EXT | 10 | 15 | 46 | III | OM.D.EXT | | 3 | 33 | 42 | I | EC.F.EXT | |
| | 17 | 52 | 7 | II | PA.D.INT | 10 | 25 | 50 | III | OM.D.INT | | 3 | 34 | 28 | I | EC.F.PEN | |
| | 19 | 54 | 13 | II | OM.F.INT | 10 | 50 | 24 | III | PA.D.EXT | 22 | 23 | 34 | I | PA.D.EXT | | |
| | 19 | 58 | 26 | II | OM.F.EXT | 11 | 0 | 33 | III | PA.D.INT | 22 | 25 | 10 | I | OM.D.EXT | | |
| | 20 | 27 | 31 | II | PA.F.INT | 13 | 18 | 9 | III | OM.F.INT | 22 | 27 | 16 | I | PA.D.INT | | |
| | 20 | 31 | 43 | II | PA.F.EXT | 13 | 28 | 14 | III | OM.F.EXT | 22 | 28 | 52 | I | OM.D.INT | | |
| 17 | 10 | 23 | 16 | I | EC.D.PEN | 13 | 57 | 54 | III | PA.F.EXT | 29 | 0 | 37 | 11 | I | PA.F.INT | |
| | 10 | 24 | 2 | I | EC.D.EXT | 17 | 49 | 10 | I | EC.D.PEN | | 0 | 39 | 48 | I | OM.F.INT | |
| | 10 | 27 | 45 | I | EC.D.INT | 17 | 49 | 56 | I | EC.D.EXT | | 0 | 40 | 53 | I | PA.F.EXT | |
| | 12 | 54 | 7 | I | OC.F.INT | 17 | 53 | 39 | I | EC.D.INT | | 0 | 43 | 30 | I | OM.F.INT | |
| | 12 | 57 | 50 | I | OC.F.EXT | 20 | 11 | 47 | I | OC.F.INT | | 3 | 22 | 58 | II | OC.D.EXT | |
| | | | | | | 20 | 15 | 30 | I | OC.F.EXT | | 3 | 27 | 6 | II | OC.D.INT | |
| 18 | 7 | 34 | 2 | I | OM.D.EXT | | | | | | | 6 | 5 | 36 | II | EC.F.INT | |
| | 7 | 37 | 44 | I | OM.D.INT | 23 | 14 | 59 | 33 | I | OM.D.EXT | | 6 | 9 | 44 | II | EC.F.EXT |
| | 7 | 48 | 42 | I | PA.D.EXT | | 15 | 3 | 15 | I | OM.D.INT | | 6 | 11 | 20 | II | EC.F.PEN |
| | 7 | 52 | 24 | I | PA.D.INT | | 15 | 6 | 9 | I | PA.D.EXT | | 14 | 4 | 41 | III | PA.D.EXT |
| | 9 | 48 | 27 | I | OM.F.INT | | 15 | 9 | 50 | I | PA.D.INT | | 14 | 14 | 36 | III | OM.D.EXT |
| | 9 | 52 | 8 | I | OM.F.EXT | | 17 | 14 | 5 | I | OM.F.INT | | 14 | 14 | 50 | III | PA.D.INT |
| | 10 | 2 | 15 | I | PA.F.INT | | 17 | 17 | 47 | I | OM.F.EXT | | 14 | 24 | 38 | III | OM.D.INT |
| | 10 | 5 | 56 | I | PA.F.EXT | | 17 | 19 | 44 | I | PA.F.INT | | 17 | 2 | 9 | III | PA.F.INT |
| | 11 | 34 | 57 | II | EC.D.PEN | | 17 | 23 | 25 | I | PA.F.EXT | | 17 | 12 | 18 | III | PA.F.EXT |
| | 11 | 36 | 32 | II | EC.D.EXT | | 19 | 49 | 44 | II | OM.D.EXT | | 17 | 17 | 57 | III | OM.F.INT |
| | 11 | 40 | 42 | II | EC.D.INT | | 19 | 53 | 56 | II | OM.D.INT | | 17 | 27 | 59 | III | OM.F.EXT |
| | 14 | 41 | 51 | II | OC.F.INT | | 20 | 2 | 40 | II | PA.D.EXT | | 19 | 40 | 51 | I | OC.D.EXT |
| | 14 | 45 | 59 | II | OC.F.EXT | | 20 | 6 | 52 | II | PA.D.INT | | 19 | 44 | 34 | I | OC.D.INT |
| | 20 | 19 | 55 | III | EC.D.PEN | 22 | 31 | 23 | II | OM.F.INT | | 21 | 58 | 39 | I | EC.F.INT | |
| | 20 | 23 | 35 | III | EC.D.EXT | | 22 | 35 | 35 | II | OM.F.EXT | | 22 | 2 | 22 | I | EC.F.EXT |
| | 20 | 33 | 54 | III | EC.D.INT | | 22 | 42 | 11 | II | PA.F.INT | | 22 | 3 | 8 | I | EC.F.PEN |
| 19 | 0 | 15 | 25 | III | OC.F.INT | | | | II | PA.F.EXT | 30 | 7 | 31 | 0 | IV | OC.D.EXT | |
| | 0 | 25 | 37 | III | OC.F.EXT | 24 | 12 | 17 | 54 | I | EC.D.PEN | | 8 | 10 | 9 | IV | OC.D.INT |
| | 4 | 51 | 51 | I | EC.D.PEN | | 12 | 18 | 39 | I | EC.D.EXT | | 10 | 4 | 21 | IV | EC.F.EXT |
| | 4 | 52 | 37 | I | EC.D.EXT | | 12 | 22 | 22 | I | EC.D.INT | | 10 | 21 | 55 | IV | EC.F.PEN |
| | 4 | 56 | 20 | I | EC.D.INT | | 14 | 37 | 44 | I | OC.F.INT | | 16 | 49 | 25 | I | PA.D.EXT |
| | 7 | 19 | 58 | I | OC.F.INT | | 14 | 41 | 27 | I | OC.F.EXT | | 16 | 53 | 6 | I | PA.D.INT |
| | 7 | 23 | 41 | I | OC.F.EXT | 25 | 9 | 28 | 4 | I | OM.D.EXT | | 16 | 53 | 44 | I | OM.D.INT |
| 20 | 2 | 2 | 33 | I | OM.D.EXT | | 9 | 31 | 46 | I | OM.D.INT | | 19 | 3 | 2 | I | PA.F.INT |
| | 2 | 6 | 15 | I | OM.D.INT | | 9 | 31 | 56 | I | PA.D.EXT | | 19 | 6 | 43 | I | PA.F.EXT |
| | 2 | 14 | 33 | I | PA.D.EXT | | 9 | 35 | 38 | I | PA.D.EXT | | 19 | 8 | 24 | I | OM.F.INT |
| | 2 | 18 | 14 | I | PA.D.INT | | 11 | 42 | 38 | I | OM.F.INT | | 19 | 12 | 5 | I | OM.F.EXT |
| | 4 | 17 | 0 | I | OM.F.INT | | 11 | 45 | 32 | I | PA.F.INT | | 22 | 17 | 14 | II | PA.D.EXT |
| | 4 | 20 | 42 | I | OM.F.EXT | | 11 | 46 | 20 | I | OM.F.EXT | | 22 | 21 | 27 | II | PA.D.INT |
| | 4 | 28 | 7 | I | PA.F.INT | | 11 | 49 | 13 | I | PA.F.EXT | | 22 | 26 | 37 | II | OM.D.EXT |
| | 4 | 31 | 48 | I | PA.F.EXT | | 14 | 9 | 23 | II | EC.D.PEN | | 22 | 30 | 48 | II | OM.D.INT |
| | 6 | 31 | 42 | II | OM.D.EXT | | 14 | 10 | 59 | II | EC.D.EXT | 31 | 0 | 56 | 37 | II | PA.F.INT |
| | 6 | 35 | 55 | II | OM.D.INT | | 14 | 15 | 8 | II | EC.D.INT | | 1 | 0 | 50 | II | PA.F.EXT |
| | 6 | 55 | 43 | II | PA.D.EXT | | 16 | 54 | 45 | II | OC.F.INT | | 1 | 8 | 35 | II | OM.F.INT |
| | 6 | 59 | 55 | II | PA.D.INT | | 16 | 58 | 53 | II | OC.F.EXT | | 1 | 12 | 46 | II | OM.F.EXT |
| | 9 | 13 | 9 | II | OM.F.INT | | | | | | | | 14 | 6 | 50 | I | OC.D.EXT |
| | 9 | 17 | 22 | II | OM.F.EXT | 26 | 0 | 20 | 22 | III | EC.D.PEN | | 14 | 10 | 33 | I | OC.D.INT |
| | 9 | 35 | 16 | II | PA.F.INT | | 0 | 24 | 1 | III | EC.D.EXT | | 16 | 27 | 25 | I | EC.F.INT |
| | 9 | 39 | 28 | II | PA.F.EXT | | 0 | 34 | 17 | III | EC.D.INT | | 16 | 31 | 8 | I | EC.F.EXT |
| | 23 | 20 | 33 | I | EC.D.PEN | | 3 | 31 | 21 | III | OC.F.INT | | 16 | 31 | 53 | I | EC.F.PEN |
| | 23 | 21 | 18 | I | EC.D.EXT | | 3 | 41 | 32 | III | OC.F.EXT | | | | | | |
| | 23 | 25 | 2 | I | EC.D.INT | | 6 | 46 | 30 | I | EC.D.PEN | 32 | 11 | 15 | 15 | I | PA.D.EXT |
| | | | | | | | 6 | 47 | 16 | I | EC.D.EXT | | 11 | 18 | 57 | I | PA.D.INT |
| 21 | 1 | 45 | 55 | I | OC.F.INT | | 6 | 50 | 59 | I | EC.D.INT | | 11 | 22 | 18 | I | OM.D.EXT |
| | 1 | 49 | 38 | I | OC.F.EXT | | 9 | 3 | 34 | I | OC.F.INT | | 11 | 25 | 59 | I | OM.D.INT |
| | 20 | 31 | 2 | I | OM.D.EXT | | 9 | 7 | 17 | I | OC.F.EXT | | 13 | 28 | 52 | I | PA.F.INT |
| | 20 | 34 | 44 | I | OM.D.INT | 27 | 3 | 56 | 38 | I | OM.D.EXT | | 13 | 32 | 34 | I | PA.F.EXT |
| | 20 | 40 | 20 | I | PA.D.EXT | | 3 | 57 | 47 | I | PA.D.EXT | | 13 | 36 | 58 | I | OM.F.INT |
| | 20 | 44 | 2 | I | PA.D.INT | | 4 | 0 | 20 | I | OM.D.INT | | 13 | 40 | 40 | I | OM.F.EXT |
| | 22 | 45 | 32 | I | OM.F.INT | | 4 | 1 | 28 | I | PA.D.INT | | 16 | 29 | 28 | II | OC.D.EXT |
| | 22 | 49 | 13 | I | OM.F.EXT | | 6 | 11 | 14 | I | OM.F.INT | | 16 | 33 | 36 | II | OC.D.INT |
| | 22 | 53 | 55 | I | PA.F.INT | | 6 | 11 | 23 | I | PA.F.INT | | 19 | 23 | 11 | II | EC.F.INT |
| | 22 | 57 | 36 | I | PA.F.EXT | | 6 | 14 | 56 | I | OM.F.EXT | | 19 | 27 | 19 | II | EC.F.EXT |
| 22 | 0 | 44 | 17 | IV | OM.D.EXT | | 6 | 15 | 4 | I | PA.F.EXT | | 19 | 28 | 54 | II | EC.F.PEN |
| | 0 | 52 | 9 | II | EC.D.PEN | | 9 | 8 | 30 | II | OM.D.EXT | | | | | | |
| | 0 | 53 | 45 | II | EC.D.EXT | | 9 | 10 | 17 | II | PA.D.EXT | | | | | | |



Dans le sens OUEST-EST, les satellites passent au-delà de Jupiter



PHÉNOMÈNES POUR 1990

LES PHENOMENES POUR 1990

Pour l'année 1990, les phénomènes sont donnés par l'intermédiaire de coefficients d'un polynôme. On a ainsi une représentation sous une forme très condensée. La précision est cependant moins bonne que celle des prédictions des phénomènes pour 1989. Cette précision et la méthode pour déterminer les phénomènes sont données ci-après.

UTILISATION DES COEFFICIENTS

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

$$T_1 = KP + \tau/24 + T_0 \quad (1)$$

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

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

avec

$$x = 2(T - T_0)/DT - 1 \quad (3)$$

T_1 ayant été obtenu par la relation (1), on peut réitérer le calcul en substituant T_1 à T dans la formule (3) pour obtenir une date T_2 plus proche du phénomène recherché que T_1 . La précision de ce type de prédiction est meilleure que 60 secondes de temps.

Les tables donnent les coefficients C_i de la formule (2), numérotés de C_0 à C_7 pour les quatre satellites et pour les phénomènes :

- débuts et fins des éclipses des satellites par Jupiter (notées 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).

PHENOMENA FOR 1990

For 1990, the phenomena are given using polynomial coefficients. So, we have a compact representation. However, the accuracy is less than the one from the data given for 1989. This accuracy and the method of calculation of the phenomena are given hereafter.

USE OF THE COEFFICIENTS

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

$$T_1 = KP + \tau/24 + T_0 \quad (1)$$

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

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

with

$$x = 2(T - T_0)/DT - 1 \quad (3)$$

The value T_1 deduced from equation (1) is then substituted in place of T in equation (3). The new iteration yields a date T_2 closer to the date of the phenomenon than T_1 . The precision of this type of prediction is better than 60 seconds of time.

The tables give the coefficients C_i in formula (2) numbered from C_0 to C_7 , 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).

EXEMPLE D'UTILISATION

Déterminons les dates des phénomènes du satellite I (Io) au voisinage du 30 juin 1990.

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

$$TO = 0 ; P = 1,7698605 ; DT = 366$$

Du 0 janvier au 30 juin 1990, 181 jours se sont écoulés, on a donc :

$$T = 181 \text{ et la formule (3) donne alors : } \\ x = 2(181 - 0)/366 - 1 = - 0.010928962$$

La formule (2) donne ensuite :

$$\tau = 14.471274 - 0.096043 x - 0.442994 x^2 + 0.106971 x^3 \\ + 0.166008 x^4 - 0.061105 x^5 + 0.015520 x^6 + 0.012950 x^7$$

$$\text{d'où : } \tau = 14,47227060$$

On a d'autre part :

$$K = \text{partie entière de } (181 - 0)/1,7698605 \\ = 102$$

La formule (1) donne alors :

$$T_1 = 102 \times 1.7698605 + 14.4722706/24 + 0 \\ T_1 = 181.1287823 \text{ jours le 0 janvier} \\ (\text{début de l'intervalle pour les éclipses}) \\ \text{soit EC.D le 30 juin 1990 à 3h 5m 27s TDT.} \\ \text{Le calcul réitéré donne } T_2 = 181.1287797 \\ \text{jours soit le 30 juin à 3h 5m 27s TDT.}$$

On trouverait de même pour les autres phénomènes :

$$\begin{aligned} \text{EC.F le 30 juin} & \text{ à 5h 21m 23s} \\ \text{OC.D le 30 juin} & \text{ à 2h 50m 36s} \\ \text{OC.F le 30 juin} & \text{ à 5h 06m 24s} \\ \text{PA.D le 1 juillet} & \text{ à 0h 06m 59s} \\ \text{PA.F le 1 juillet} & \text{ à 2h 23m 41s} \\ \text{OM.D le 1 juillet} & \text{ à 0h 21m 06s} \\ \text{OM.F le 1 juillet} & \text{ à 2h 37m 55s} \end{aligned}$$

EXAMPLE

Let us find the dates of the phenomena of satellite I (Io) which takes place near the 30th of June 1990.

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

$$TO = 0 ; P = 11.7698605 ; DT = 366$$

Between January 0 to June the 30th 1990, 181 days have elapsed :

$$T = 181 \text{ and formula (3) gives : } \\ x = 2(181 - 0)/366 - 1 = - 0.010928962$$

formula (2) then gives :

$$\text{therefore } \tau = 14.47227060$$

On the other hand,

$$K = \text{integer part of } (181 - 0)/1.7698605 \\ = 102$$

formula (2) then gives :

$$\begin{aligned} T_1 &= 102 \times 1.7698605 + 14.4722706/24 + 0 \\ T_1 &= 181.1287823 \text{ days from January 0} \\ &(\text{beginning of the interval for the occultations}) \text{ that is June the 30th 1990} \\ &\text{at 3h 5m 27s TDT. Another iterations gives} \\ T_2 &= 181.1287797 \text{ days that is June the} \\ &\text{30th 1990 at 3h 5m 27s TDT.} \end{aligned}$$

One would find as well for the other phenomena :

$$\begin{aligned} \text{EC.F June the 30th at 5h 21m 23s} \\ \text{OC.D June the 30th at 2h 50m 36s} \\ \text{OC.F June the 30th at 5h 06m 24s} \\ \text{PA.D July the 1st at 0h 06m 59s} \\ \text{PA.F July the 1st at 2h 23m 41s} \\ \text{OM.D July the 1st at 0h 21m 06s} \\ \text{OM.F July the 1st at 2h 37m 55s} \end{aligned}$$

CONDITIONS D'EXISTENCE DES PHENOMENES

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'éclipse 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 2h 50m 36s observable

EC.D le 30 juin à 3h 5m 27s inobservable
car déjà occulté

OC.F le 30 juin à 5h 6m 24s inobservable
car toujours éclipsé

EC.F le 30 juin à 5h 21s 23s 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.

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 30th at 2h 50m 36s observable

EC.D June 30th at 3h 5m 27s unobservable
as occulted

OC.F June 30th at 5h 6m 24s unobservable
as already eclipsed

EC.F June 30th at 5h 21s 23s 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 |
| 1 | -0.096043 | 1 | -0.059925 | 1 | 0.190572 |
| 2 | -0.442994 | 2 | -0.419022 | 2 | -0.480106 |
| 3 | 0.106971 | 3 | 0.098070 | 3 | -0.123791 |
| 4 | 0.166008 | 4 | 0.147819 | 4 | 0.147900 |
| 5 | -0.061105 | 5 | -0.057549 | 5 | -0.131162 |
| 6 | 0.015520 | 6 | 0.019750 | 6 | 0.027202 |
| 7 | 0.012950 | 7 | 0.011636 | 7 | 0.083993 |
| | | OC.D | OC.F | PA.D | PA.F |
| 0 | 14.254673 | 0 | 16.516877 | 0 | 35.515297 |
| 1 | 2.892839 | 1 | 2.954998 | 1 | 3.204865 |
| 2 | -0.006044 | 2 | 0.034334 | 2 | -0.029909 |
| 3 | -1.942590 | 3 | -1.988870 | 3 | -2.506492 |
| 4 | 0.593794 | 4 | 0.551607 | 4 | 0.506931 |
| 5 | -1.448264 | 5 | -1.424945 | 5 | -0.985656 |
| 6 | -0.341139 | 6 | -0.324471 | 6 | -0.279008 |
| 7 | 0.839137 | 7 | 0.832477 | 7 | 0.676041 |
| 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 |
| 1 | 0.662075 | 1 | 0.757898 | 1 | -0.615072 |
| 2 | -0.701295 | 2 | -0.818957 | 2 | -0.215114 |
| 3 | -0.823903 | 3 | -0.802949 | 3 | 0.742716 |
| 4 | 0.278458 | 4 | 0.330976 | 4 | -0.005534 |
| 5 | 0.256477 | 5 | 0.237400 | 5 | -0.433101 |
| 6 | 0.011201 | 6 | 0.000174 | 6 | 0.055459 |
| 7 | -0.029115 | 7 | -0.021451 | 7 | 0.128850 |
| 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 |
| 1 | 6.788897 | 1 | 7.000109 | 1 | 5.254953 |
| 2 | 0.246022 | 2 | 0.087132 | 2 | 0.762197 |
| 3 | -5.654483 | 3 | -5.794107 | 3 | -3.191430 |
| 4 | 1.228239 | 4 | 1.366999 | 4 | 0.809432 |
| 5 | -1.677764 | 5 | -1.632473 | 5 | -3.206324 |
| 6 | -0.786342 | 6 | -0.826448 | 6 | -0.648484 |
| 7 | 1.344617 | 7 | 1.341710 | 7 | 1.723795 |
| 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 |
| 1 | -0.197178 | 1 | 0.100831 | 1 | -0.060745 |
| 2 | -0.501392 | 2 | -0.563190 | 2 | -0.510915 |
| 3 | -0.004581 | 3 | -0.027137 | 3 | 0.011446 |
| 4 | 0.148773 | 4 | 0.147843 | 4 | 0.178841 |
| 5 | 0.080130 | 5 | 0.110349 | 5 | -0.277581 |
| 6 | 0.043027 | 6 | 0.043702 | 6 | -0.020041 |
| 7 | -0.062104 | 7 | -0.079211 | 7 | 0.154122 |
| OC.D | | OC.F | PA.D | | PA.F |
| 0 | 51.704097 | 0 | 55.032823 | 0 | 137.653831 |
| 1 | 11.953253 | 1 | 12.491729 | 1 | 12.027675 |
| 2 | 1.223336 | 2 | 1.256565 | 2 | 1.238148 |
| 3 | -8.646816 | 3 | -8.995430 | 3 | -8.848476 |
| 4 | 1.942383 | 4 | 1.847419 | 4 | 1.842983 |
| 5 | -5.116283 | 5 | -4.908595 | 5 | -4.960676 |
| 6 | -1.432075 | 6 | -1.382307 | 6 | -1.401229 |
| 7 | 3.139600 | 7 | 3.065109 | 7 | 3.109118 |
| 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 |
| 1 | -0.576120 | 1 | 0.747263 | 1 | -0.829133 |
| 2 | -0.396207 | 2 | -0.934306 | 2 | -0.352315 |
| 3 | -0.073019 | 3 | 0.052869 | 3 | 0.044917 |
| 4 | 0.210673 | 4 | 0.183092 | 4 | 0.089478 |
| 5 | -0.114822 | 5 | -0.089039 | 5 | -0.306178 |
| 6 | 0.047291 | 6 | -0.035816 | 6 | 0.086803 |
| 7 | 0.040159 | 7 | 0.086820 | 7 | 0.108397 |
| 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 |
| 1 | 27.956935 | 1 | 30.426773 | 1 | 27.193872 |
| 2 | 0.865562 | 2 | -0.137772 | 2 | 0.553638 |
| 3 | -19.810172 | 3 | -20.958125 | 3 | -19.511115 |
| 4 | 0.443453 | 4 | 0.679186 | 4 | 0.743776 |
| 5 | -12.774284 | 5 | -12.091840 | 5 | -12.439464 |
| 6 | -0.432532 | 6 | -0.320592 | 6 | -0.497802 |
| 7 | 7.543955 | 7 | 7.233039 | 7 | 7.333916 |
| TO = 0 CORRESPOND AU 0 JANVIER 1990 à 0 H SOIT LA DATE JULIENNE 2447891.5 | | | | | |