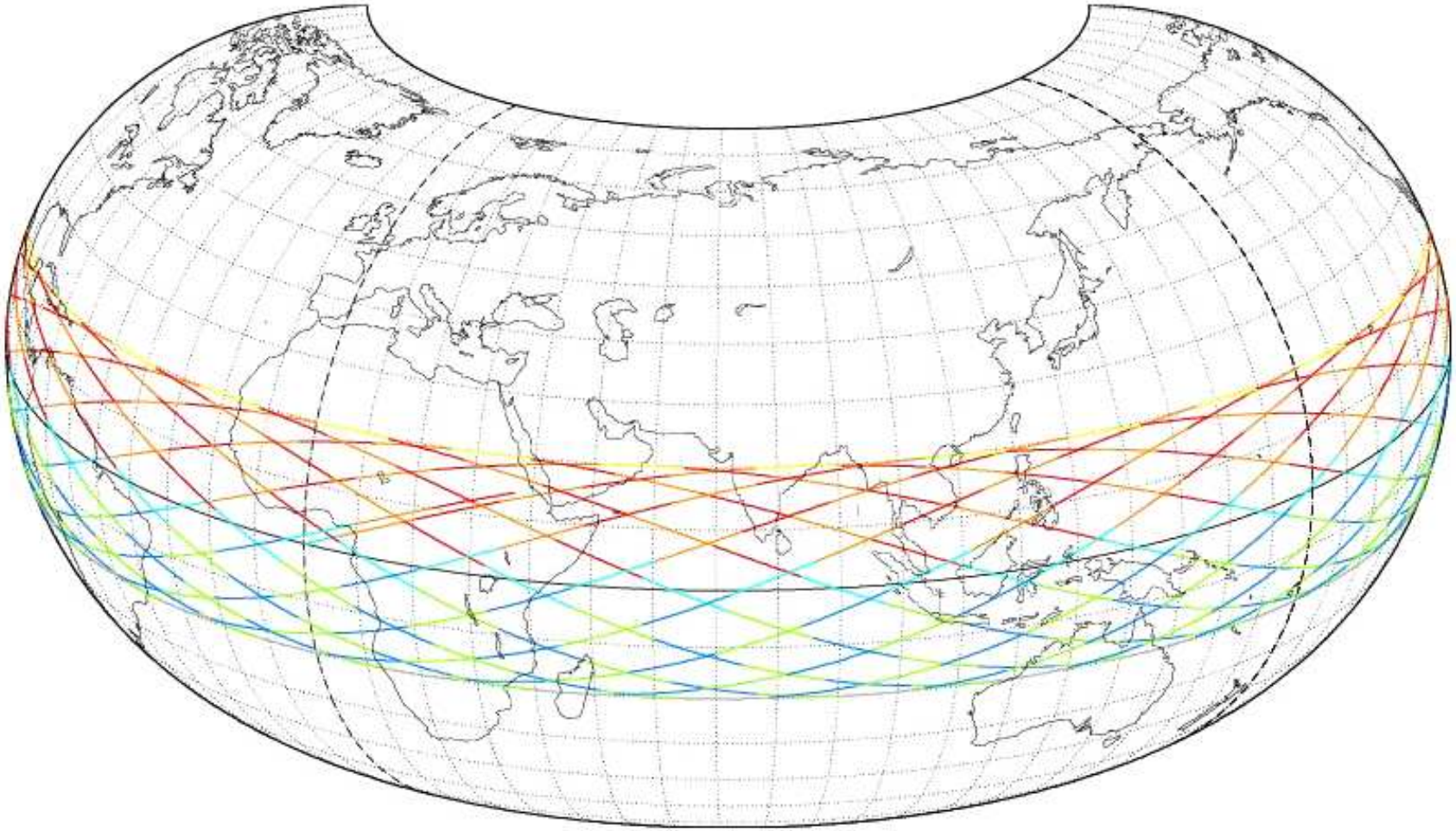
मेघ – Tropiques



The MT Orbit
and its Angular Sampling

Michel Capderou
(LMD / IPSL Paris)

- Megha-Tropiques (MT) is a LEO satellite, with circular orbit.

Semi-major axis a = 7243.679 km

➔ altitude h = 866 km

Its originality is its ***inclination***:

i = 20 degrees

- Views of the MT orbit (Terrestrial referential frame)
- Views of the ground track

Megha-Tropiques
Orbit - ref.: Earth

Altitude = 865.6 km a = 7243.700 km

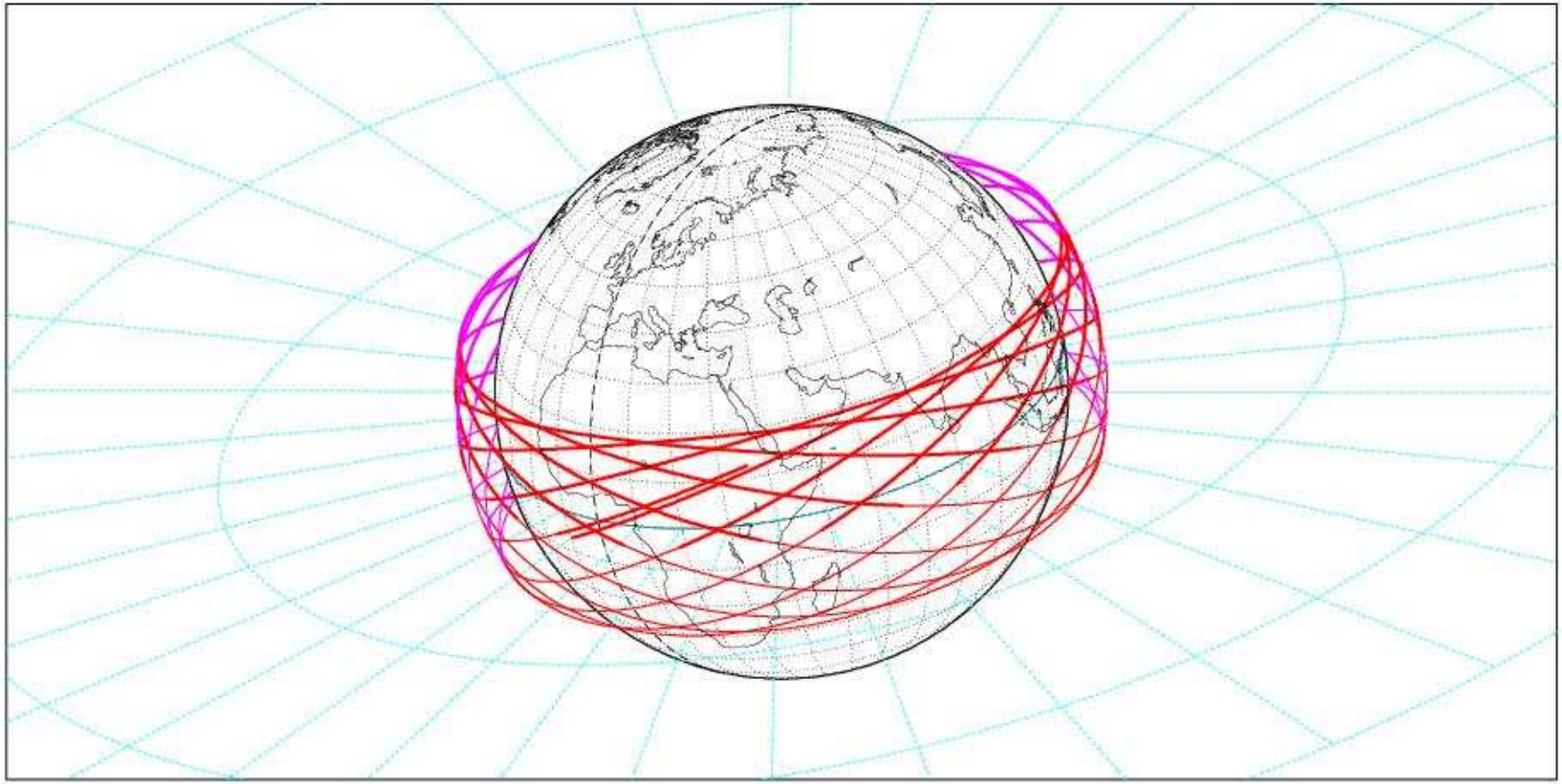
Inclination = 20.00 °

Recurrence = [14; -1; 7] 97

Period = 101.93 min * rev/day =14.13

>>>> Time span shown: 1440.0 min = 1.00 day

Equat. orbital shift = 2892.0 km (26.0 °)



Projection: Orthographic Map centre: 26.0 ° N; 46.0 °E Asc. node: 0.00 °

Property: none Aspect: Oblique

T.:Azimuthal ⊕ Graticule: 10° [-78.0 / +64.0 / +44.0] Gr.Mod.: GRIM5-C1

Ιξιων
MC ★ LMD
Ατλας

Megha-Tropiques
Orbit - ref.: Earth

Altitude = 865.6 km a = 7243.700 km

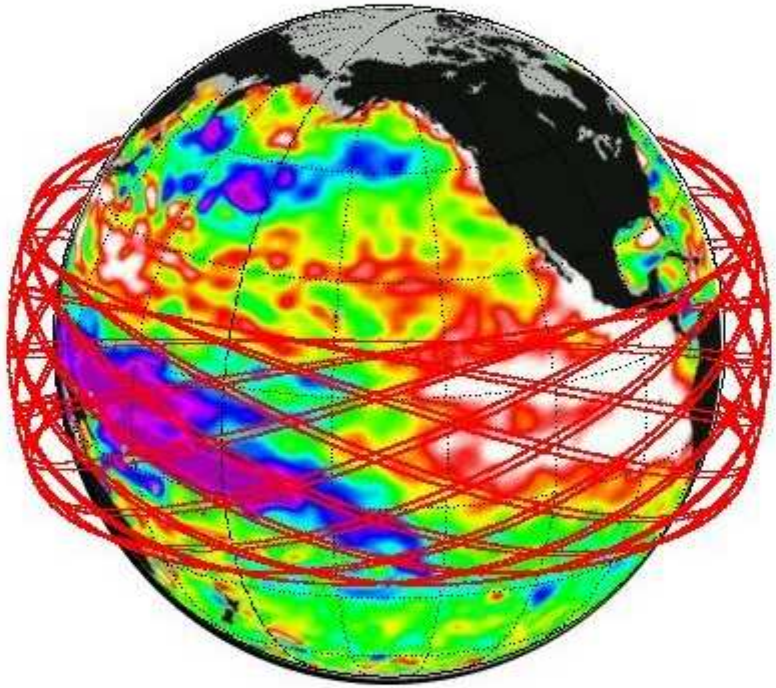
Inclination = 20.00 °

Recurrence = [14; -1; 7] 97

Period = 101.93 min * rev/day =14.13

>>>> Time span shown: 2880.0 min = 2.00 days

Equat. orbital shift = 2892.0 km (26.0 °)



Projection: Orthographic Map centre: 20.0 ° N: 150.0 ° W Asc. node: 0.00 °

Property: none Aspect: Oblique

T.:Azimuthal ⊕ Graticule: 20° [-90.0 / +70.0 / -120.0] Gr.Mod.: GEM-T2

Ξιων

MC ⋆ LMD

Ατλας

Megha-Tropiques
Orbit - ref.: Earth

Recurrence = [14; -1; 7] 97

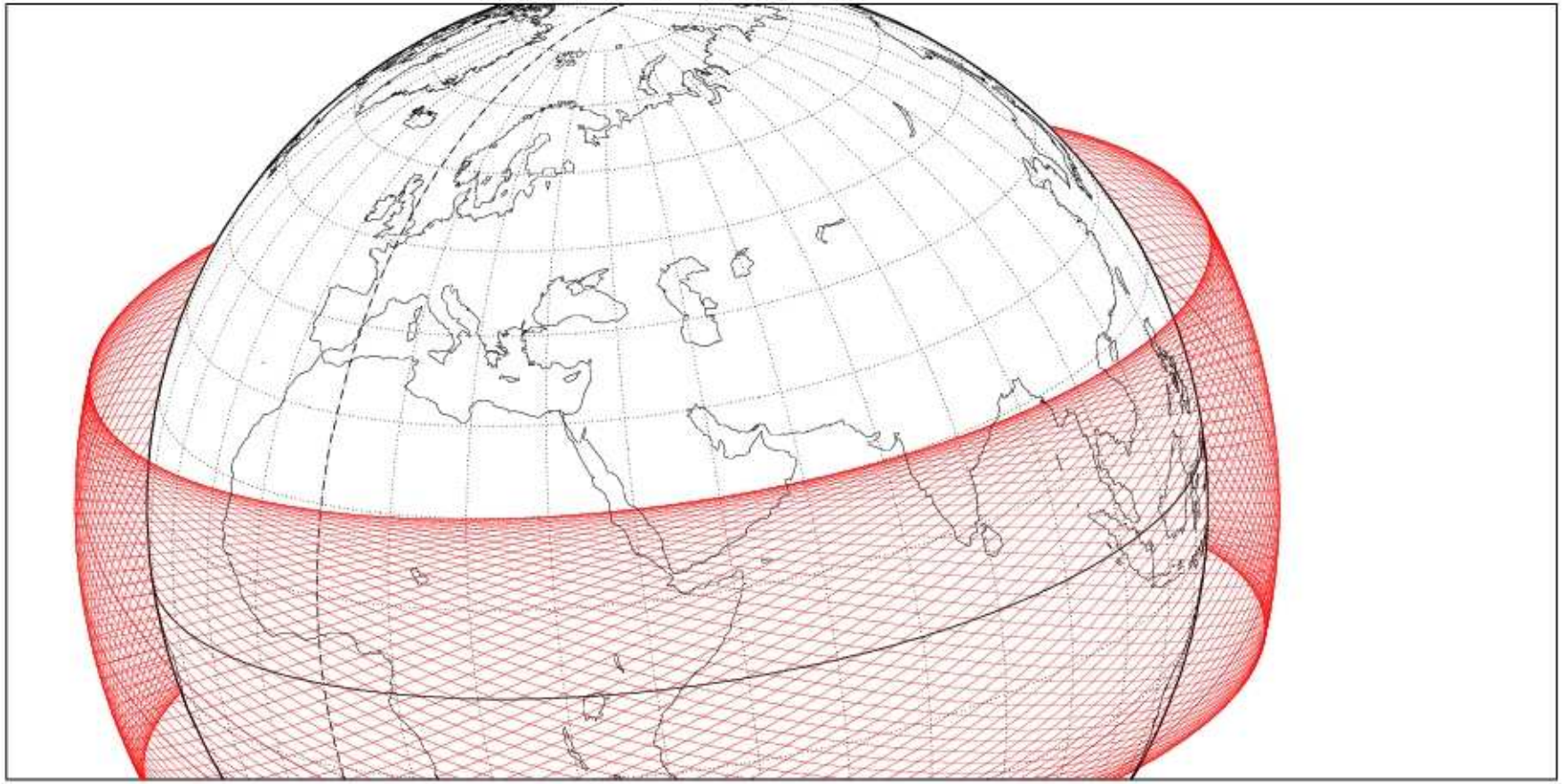
>>>> Time span shown: 7.00 days

Altitude = 865.5 km a = 7243.677 km

Inclination = 20.00 °

Period = 101.93 min * rev/day =14.13

Equat. orbital shift = 2892.0 km (26.0 °)



Projection: Orthographic PC: 20.0 ° N; 45.0 °E /ZC: 30.0 ° N; 60.0 ° E Asc. node: -180.00 ° [00:00 LMT]

Property: none Aspect: Oblique

⊕ T.:Azimuthal - Graticule: 10° {4.2} [-90.0/ +70.0/ +45.0] [+8] EIGEN-C3

Ξιων

MC ★ LMD

Ατλας

- ***Recurrent*** cycle: 7 days
- 97 revolutions in the cycle (6.87 d)
- Grid interval: 3.711° or 413 km

Megha-Tropiques
Orbit - Ground track

Altitude = 865.5 km a = 7243.678 km

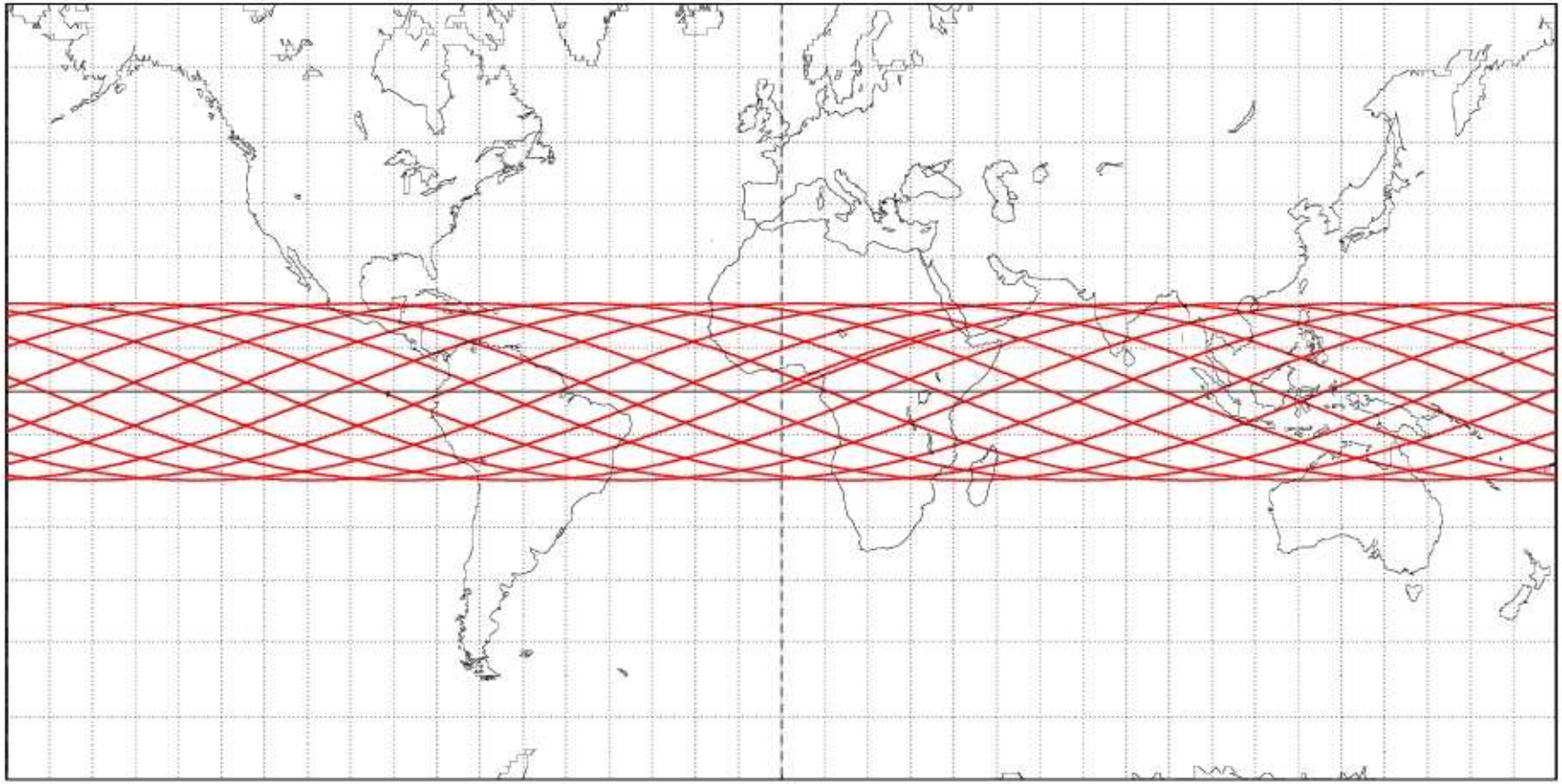
Inclination = 20.00 °

Recurrence = [14; -1; 7] 97

Period = 101.93 min * rev/day =14.13

>>>> Time span shown: 1440.0 min = 1.00 day

Equat. orbital shift = 2892.0 km (26.0 °)



Projection: Mercator Project. centre: 0.0 ° ; 0.0 ° Asc. node: 0.00 °

Property: Conformal Aspect: Direct App. inclin. = 21.52 °

⊕ T.:Cylindrical - Graticule: 10° {4.2} [+0.0/ +0.0/ +0.0] [-] EGM96

Ιξιων
MC ★ LMD
Ατλας

Megha-Tropiques
Orbit - Ground track

Altitude = 865.5 km a = 7243.678 km

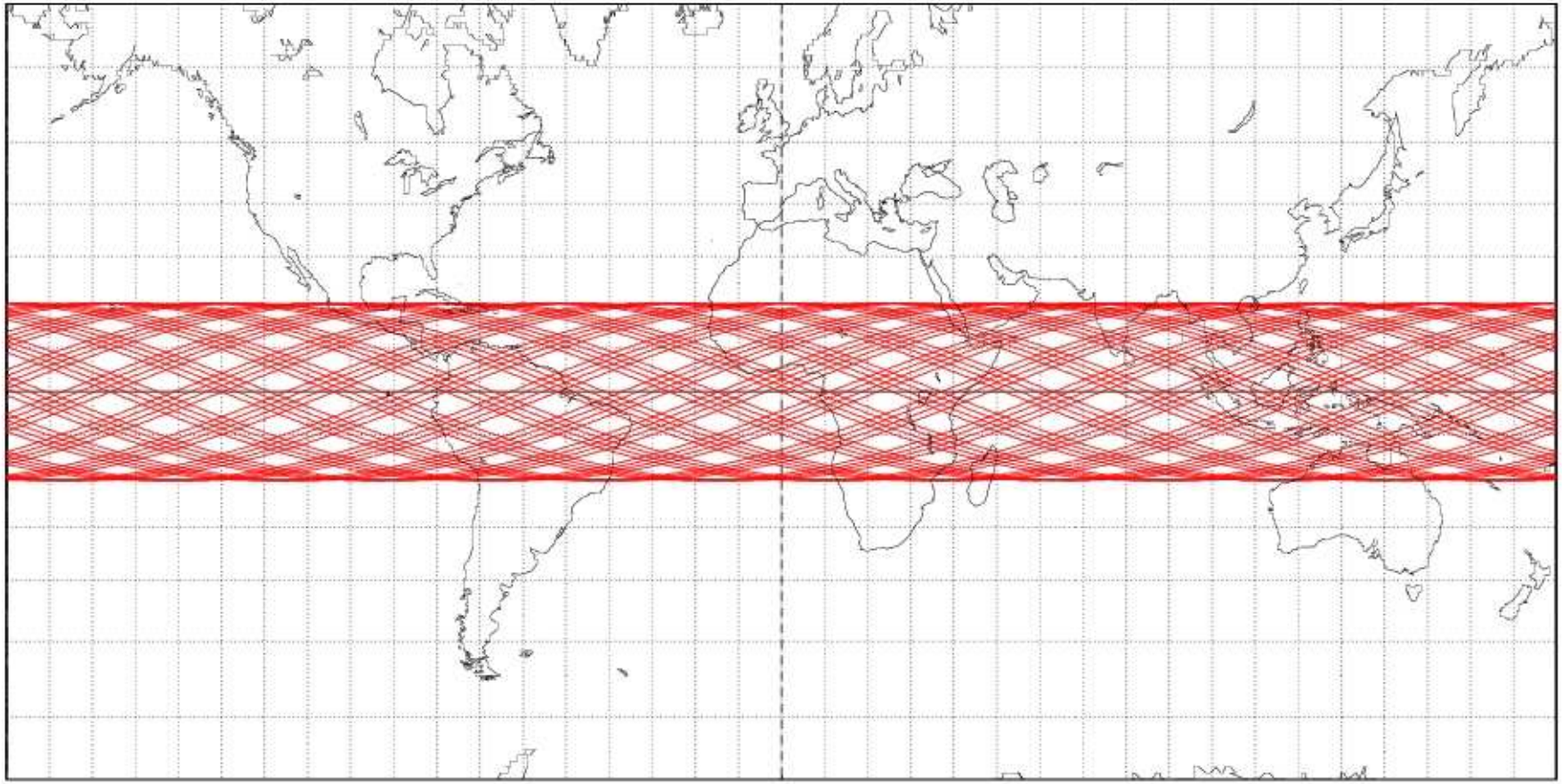
Inclination = 20.00 °

Recurrence = [14; -1; 7] 97

Period = 101.93 min * rev/day =14.13

>>>> Time span shown: 5760.0 min = 4.00 days

Equat. orbital shift = 2892.0 km (26.0 °)



Projection: Mercator Project. centre: 0.0 ° ; 0.0 ° Asc. node: 0.00 °

Property: Conformal Aspect: Direct App. inclin. = 21.52 °

⊕ T.:Cylindrical - Graticule: 10° {4.2} [+0.0/ +0.0/ +0.0] [-] EGM96

Ιξιων
MC ★ LMD
Ατλας

Megha-Tropiques
Orbit - Ground track

Altitude = 865.5 km a = 7243.678 km

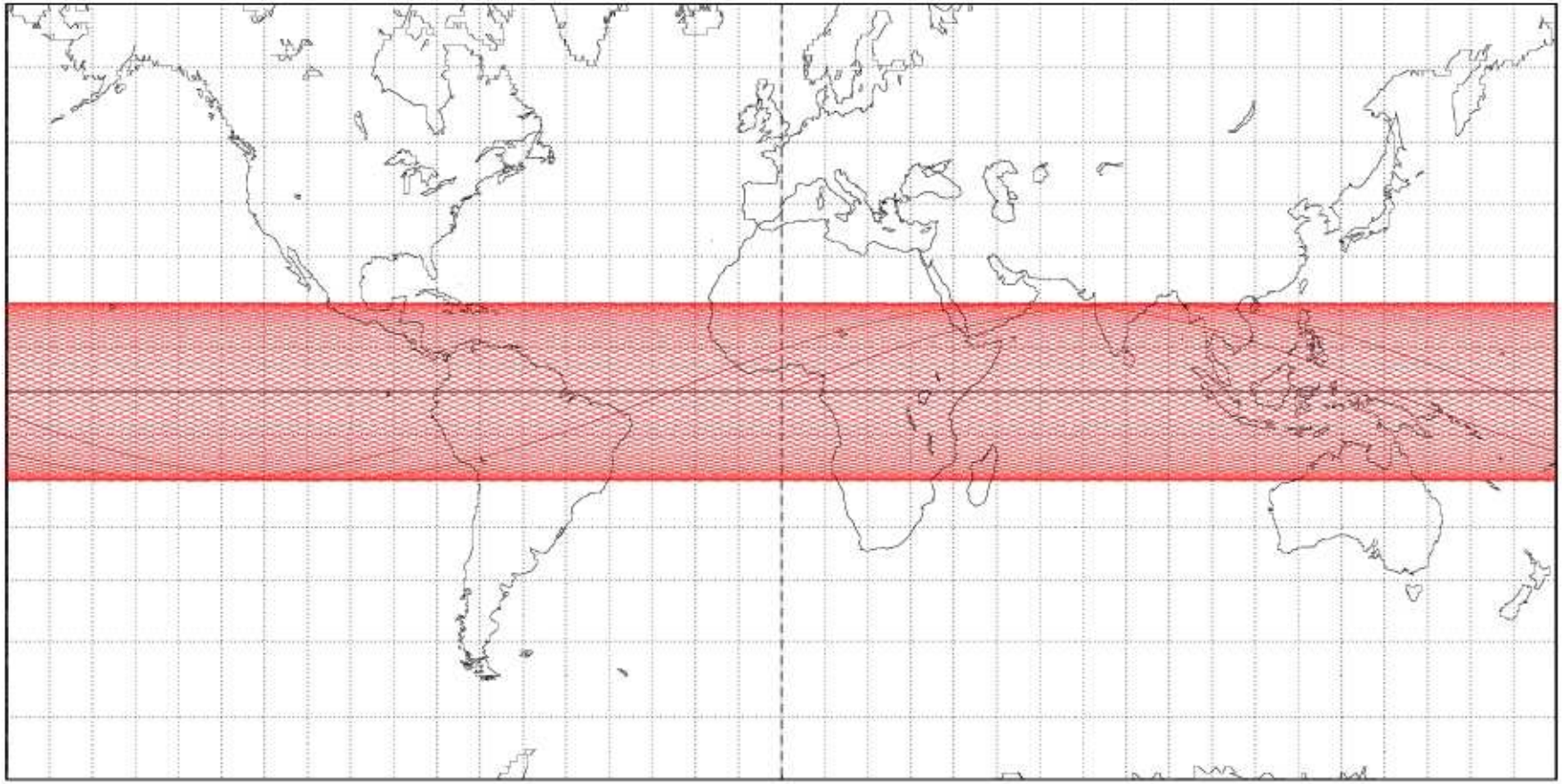
Inclination = 20.00 °

Recurrence = [14; -1; 7] 97

Period = 101.93 min * rev/day =14.13

>>>> Time span shown: 7.00 days

Equat. orbital shift = 2892.0 km (26.0 °)



Projection: Mercator Project. centre: 0.0 ° ; 0.0 ° Asc. node: 0.00 °

Property: Conformal Aspect: Direct App. inclin. = 21.52 °

⊕ T.:Cylindrical - Graticule: 10° {4.2} [+0.0/ +0.0/ +0.0] [-] EGM96

Ιξιων
MC ★ LMD
Ατλας

- Ground track with ***LMT***

(notation of the Local Solar Mean Time)

Megha-Tropiques
Orbit - Ground track

Altitude = 865.5 km a = 7243.678 km

Inclination = 20.00 °

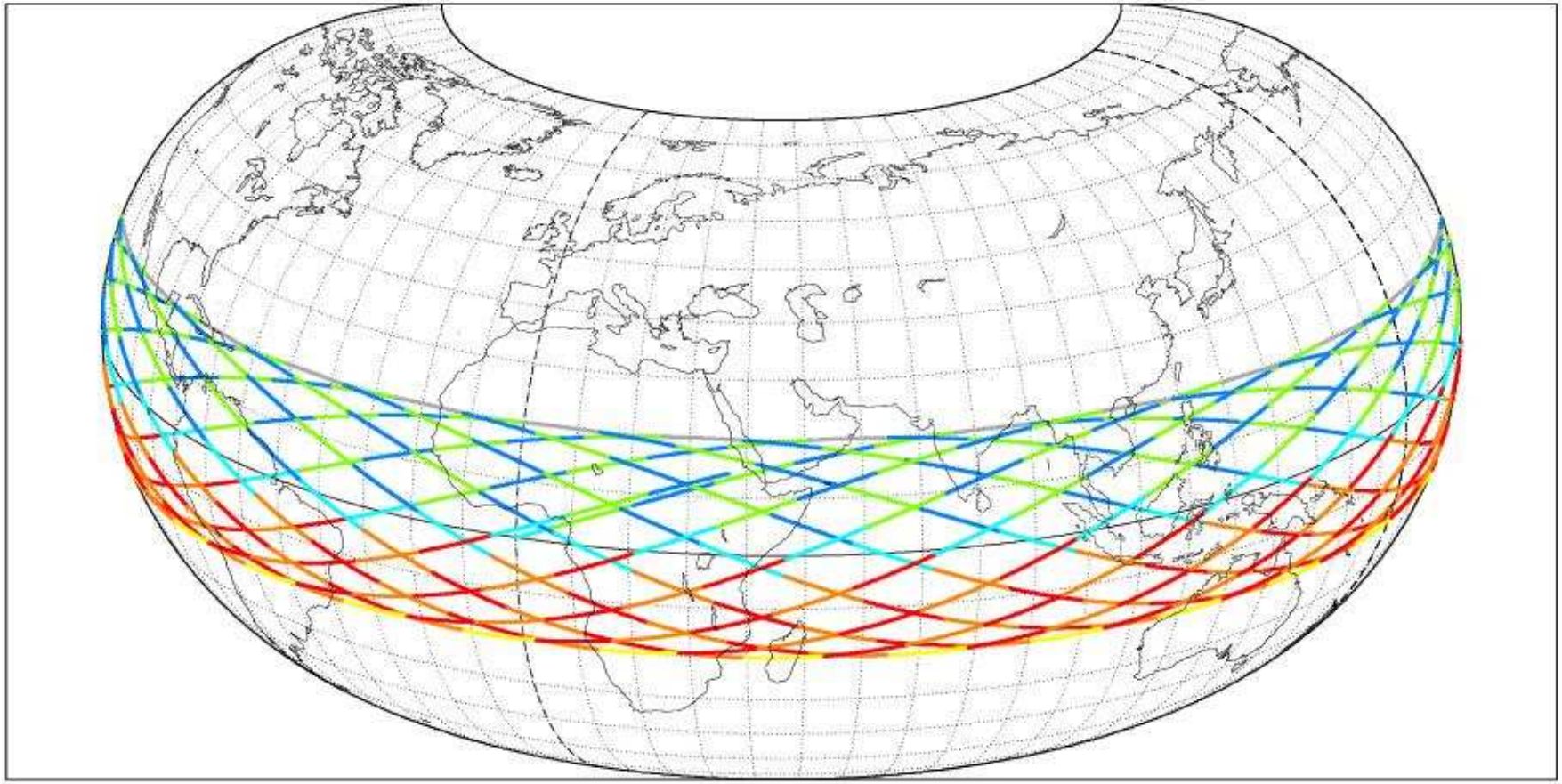
Recurrence = [14; -1; 7] 97

Period = 101.93 min * rev/day =14.13

>>>> Time span shown: 1440.0 min = 1.00 day

Equat. orbital shift = 2892.0 km (26.0 °)

LMT (local) 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 hours



Projection: Raisz Armadillo M.C.: 0.0 ° ; 46.0 °E / 28.1 ° N; 46.0 °E Asc. node: 0.00 ° [18:00 LMT]

Property: none Aspect: Direct App. inclin. = 21.52 °

⊕ T.:(various) - Graticule: 10° {4.2} [+90.0/ +0.0/-136.0] [-] GEM-T2

Ξιων

MC ★ LMD

Ατλας

Megha-Tropiques
Orbit - Ground track

Altitude = 865.5 km a = 7243.678 km

Inclination = 20.00 °

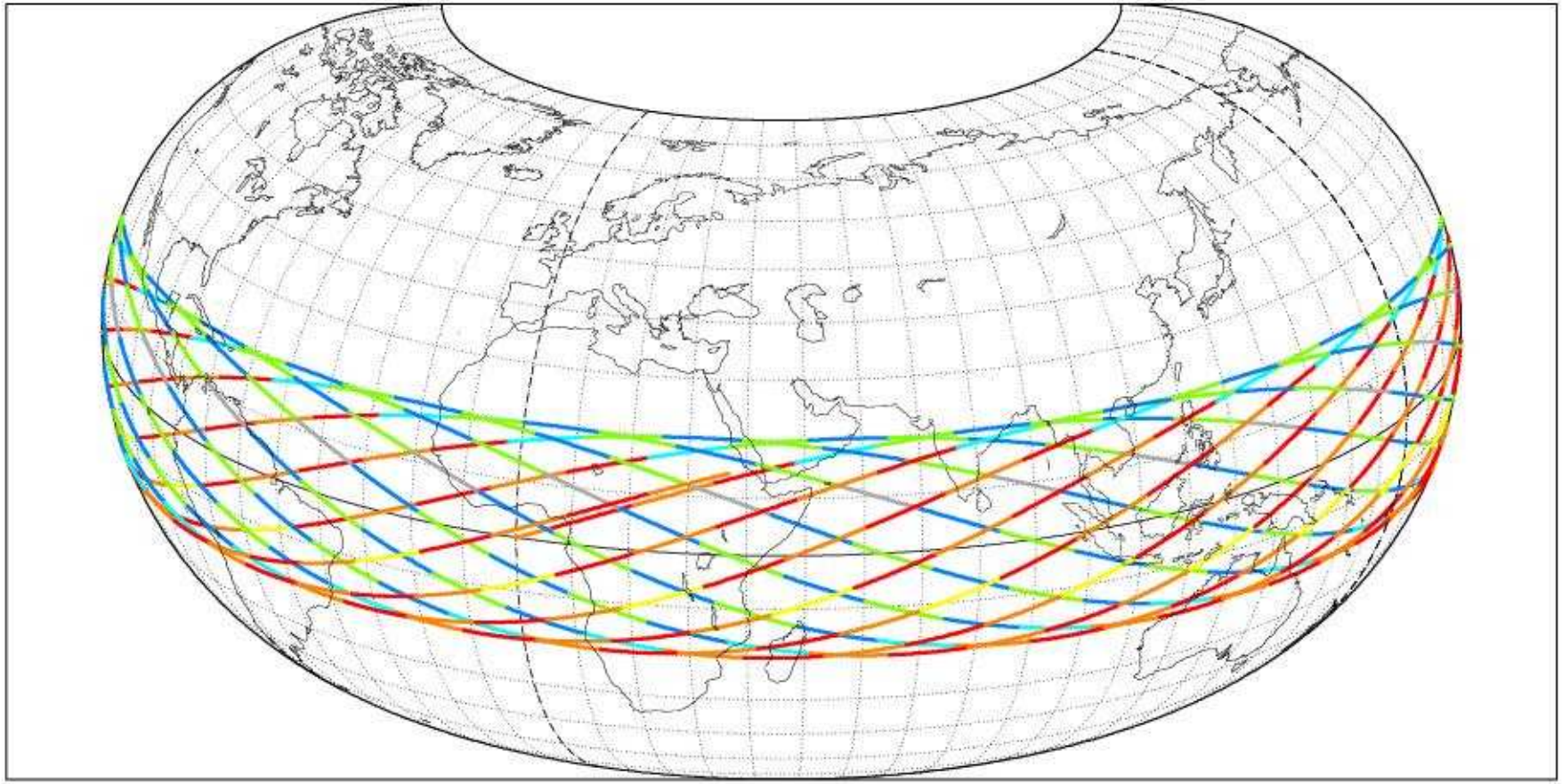
Recurrence = [14; -1; 7] 97

Period = 101.93 min * rev/day =14.13

>>>> Time span shown: 1440.0 min = 1.00 day

Equat. orbital shift = 2892.0 km (26.0 °)

LMT (local) 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 hours



Projection: Raisz Armadillo M.C.: 0.0 ° ; 46.0 °E / 28.1 ° N; 46.0 °E Asc. node: 0.00 ° [14:00 LMT]

Property: none Aspect: Direct App. inclin. = 21.52 °

⊕ T.:(various) - Graticule: 10° {4.2} [+90.0/ +0.0/-136.0] [-] GEM-T2

Ιξιων
MC ★ LMD
Ατλας

Megha-Tropiques
Orbit - Ground track

Altitude = 865.5 km a = 7243.678 km

Inclination = 20.00 °

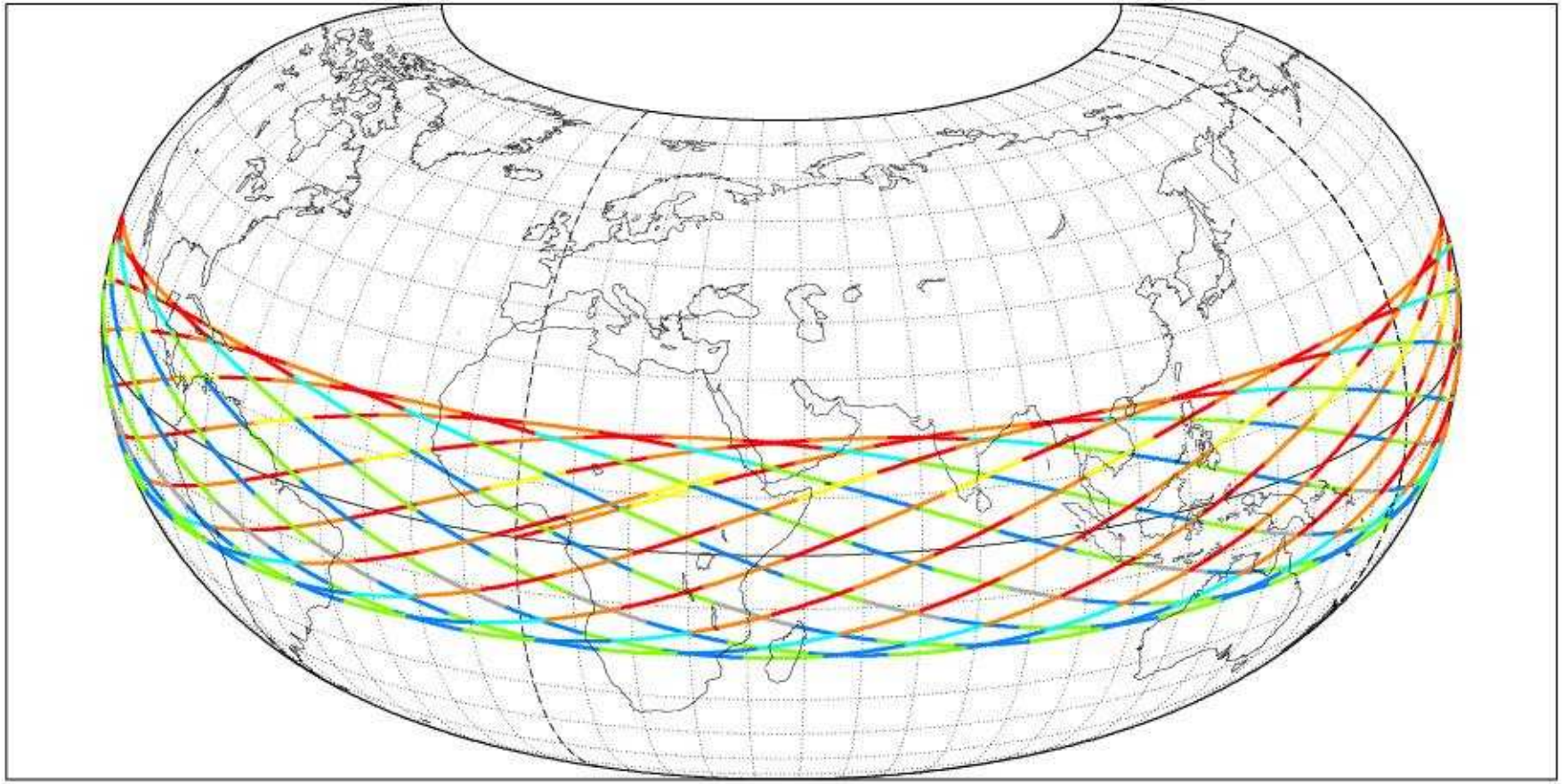
Recurrence = [14; -1; 7] 97

Period = 101.93 min * rev/day =14.13

>>>> Time span shown: 1440.0 min = 1.00 day

Equat. orbital shift = 2892.0 km (26.0 °)

LMT (local) 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 hours



Projection: Raisz Armadillo M.C.: 0.0 ° ; 46.0 °E / 28.1 ° N; 46.0 °E Asc. node: 0.00 ° [10:00 LMT]

Property: none Aspect: Direct App. inclin. = 21.52 °

⊕ T.:(various) - Graticule: 10° {4.2} [+90.0/ +0.0/-136.0] [-] GEM-T2

Ξιων
MC ★ LMD
Ατλας

Megha-Tropiques
Orbit - Ground track

Altitude = 865.5 km a = 7243.678 km

Inclination = 20.00 °

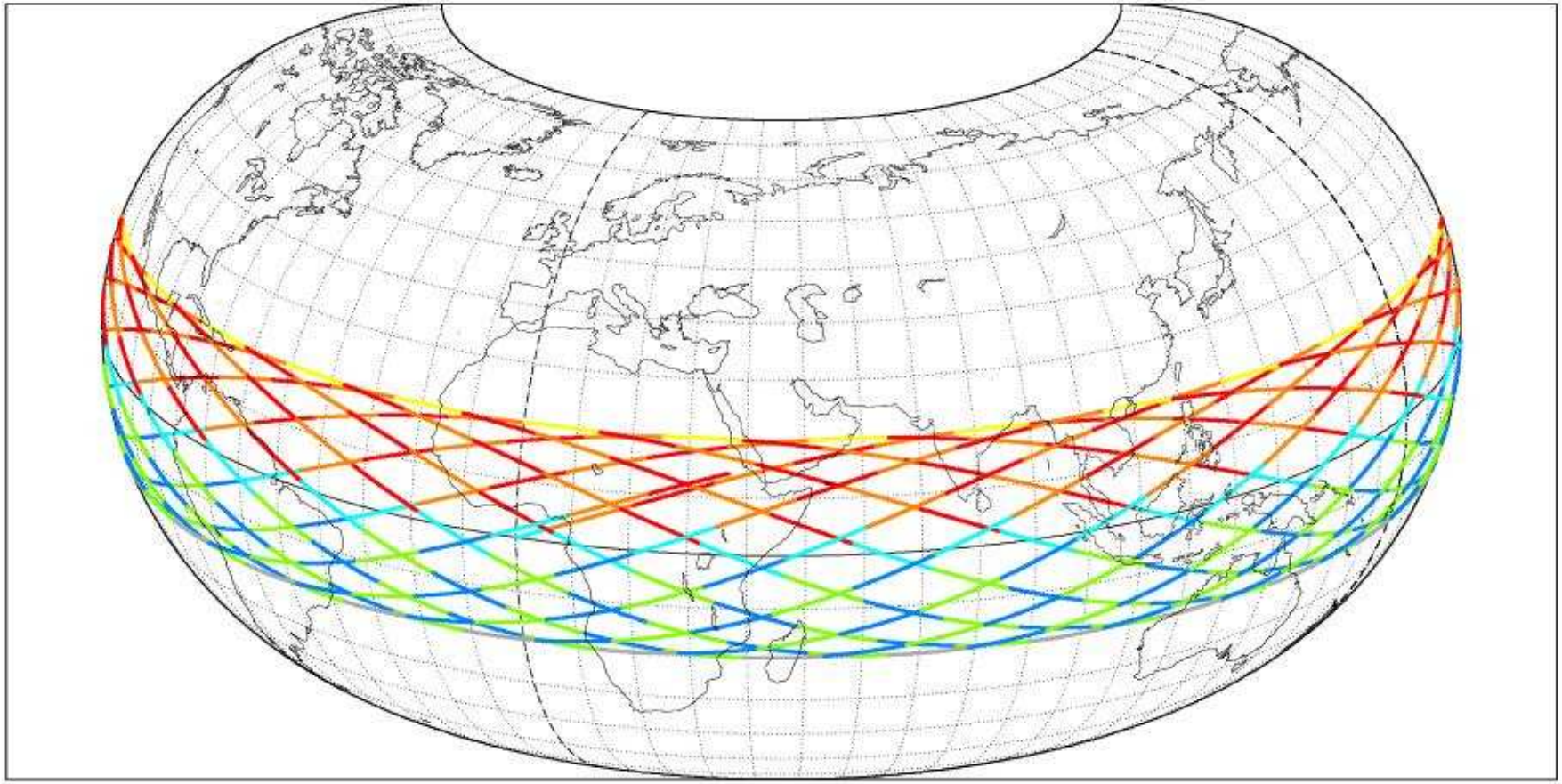
Recurrence = [14; -1; 7] 97

Period = 101.93 min * rev/day =14.13

>>>> Time span shown: 1440.0 min = 1.00 day

Equat. orbital shift = 2892.0 km (26.0 °)

LMT (local) 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 hours

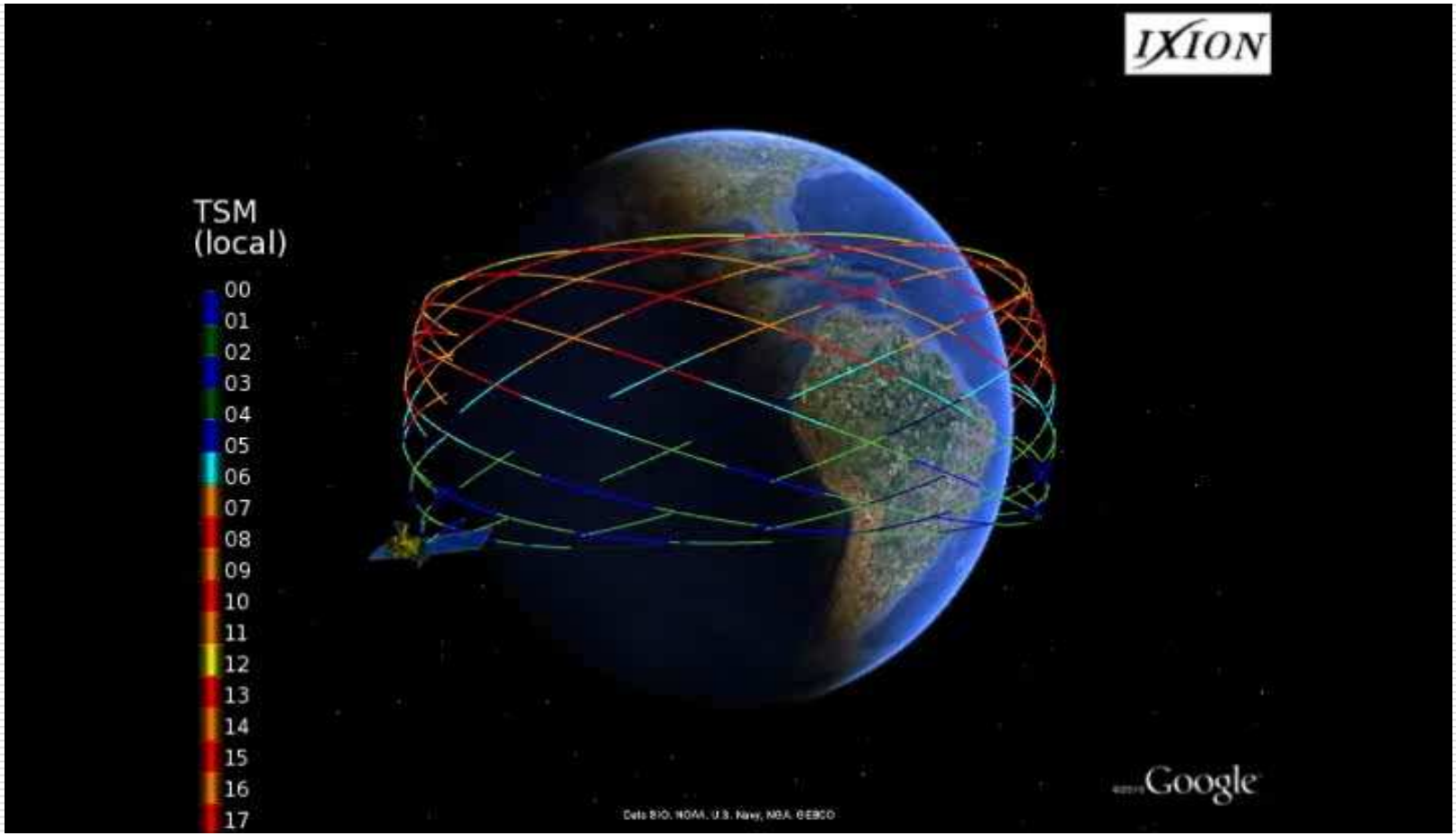


Projection: Raisz Armadillo M.C.: 0.0 ° ; 46.0 °E / 28.1 ° N; 46.0 °E Asc. node: 0.00 ° [06:00 LMT]

Property: none Aspect: Direct App. inclin. = 21.52 °

⊕ T.:(various) - Graticule: 10° {4.2} [+90.0/ +0.0/-136.0] [-] GEM-T2

Ιξιων
MC ★ LMD
Ατλας


IXION
TSM
(local)
00
01
02
03
04
05
06
07
08
09
10
11
12
13
14
15
16
17
Google

- ***Precession cycle*** :
the time interval needed for
the hour angle of ascending node
to vary by 24 hr.

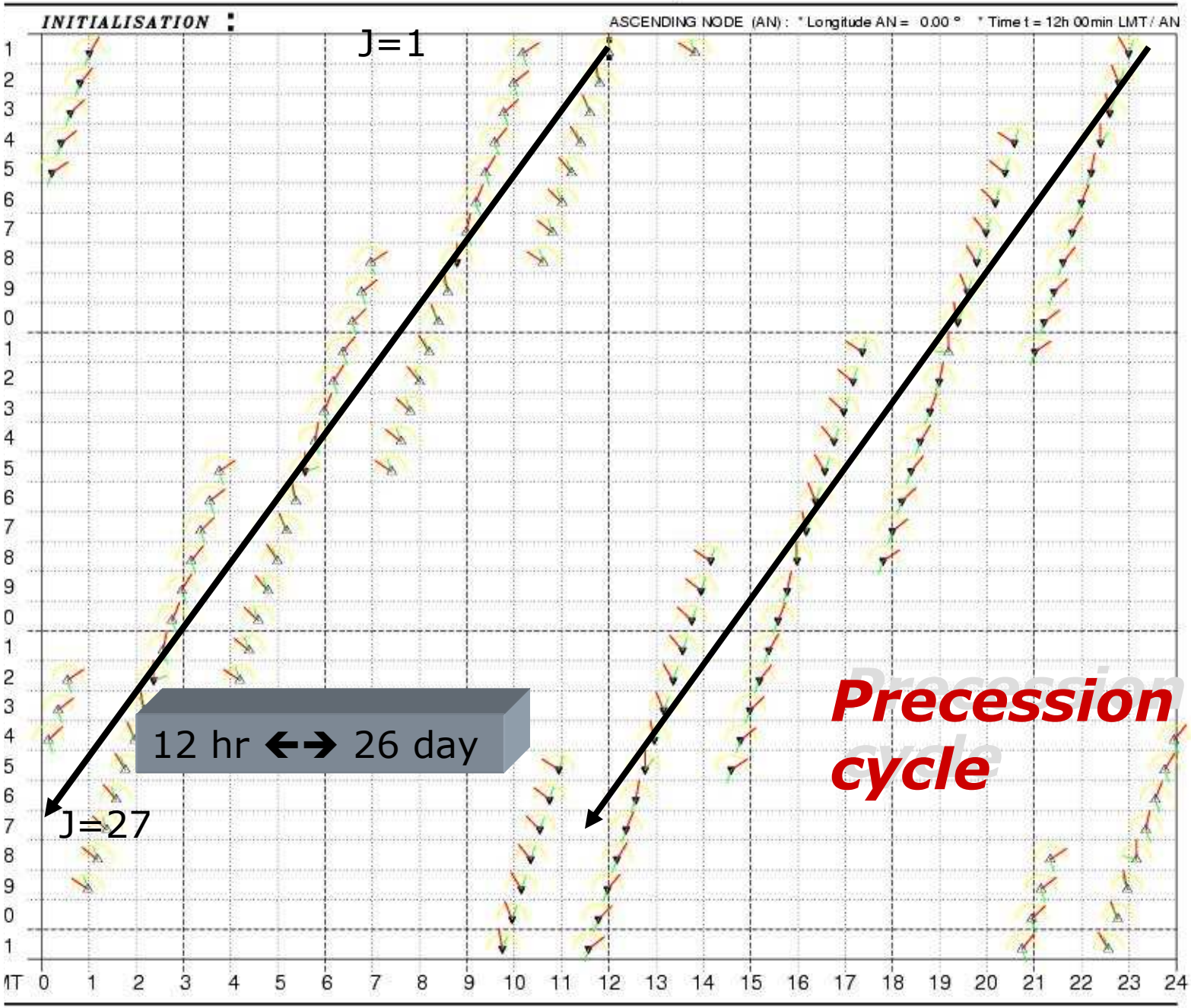
- For Megha-Tropiques,
the precession cycle is short : ***51 days***
(or 28 minutes each day)

Recurrence cycle = 7 days [14; -1; 7] 97
Precession cycle= 51 days (Cs= -51.3)

Megha-Trop. / ScaRaB

0 °

MONTHLY TABLE



OVERPASSES (n = 136)
OF SATELLITE S [GEM-T2
FOR POINT P
- Latitude : 0.0 °
- Longitude : 0.0 °
For P: UTC = LMT + 00h 00m

FIELD OF VIEW : 97.8 °

(1) (2) P-S DIRECTION
△ ASC ▼ DES

Right-handed system

- Zenith angle (in the plane orthogonal to the track). (1)
- Azimuth (in the local horizontal plane) with respect to the North. (2)

ORBIT a = 7243.700 km
Altitude = 865.6 km
Inclination = 20.00 °
Equatorial shift= 2892.0 km
Period = 101.93 min
Mean mot. = 14.13 rev/day

SCANNING
Half-swath = 48.9 °
Maximal zenith angle = 58.9 °
H.-swath (ground) = 1108.3 km
Equatorial overlap = 2.089
Max. attained latit. = 30.0 °

Ιξιων
MC ★ LMD

- Other particular point,

resulting of the 20-degree inclination:

for the latitudes between

10° and 25° (North and South),

the ***temporal sampling*** is represented

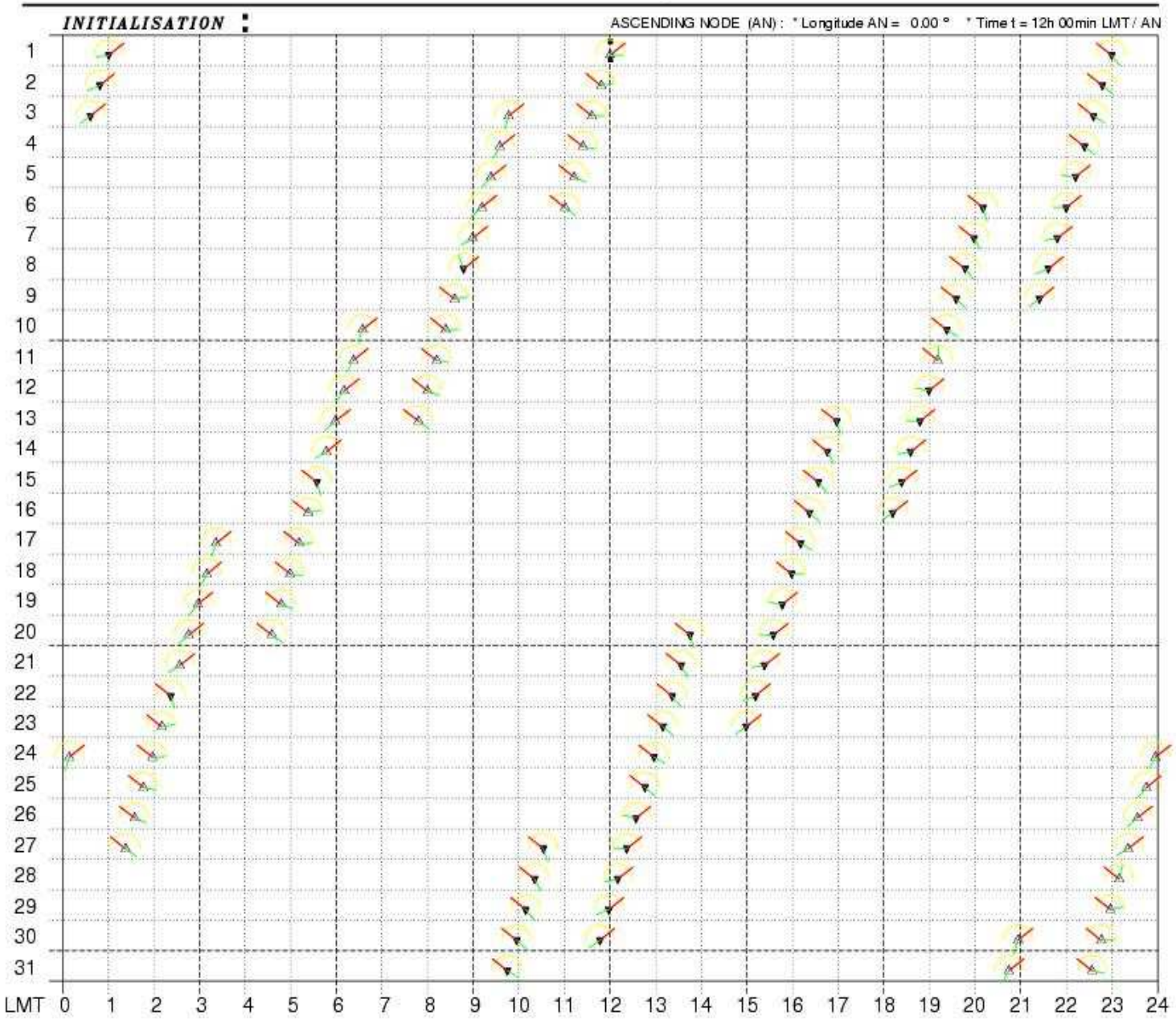
- by a « pack » of overpasses
- followed by a « lack » (without overpass)

Recurrence cycle = 7 days [14; -1; 7] 97
Precession cycle= 51 days (Cs= -51.3)
***

Megha-Trop. / MADRAS

0 °

MONTHLY TABLE



OVERPASSES (n = 100)
OF SATELLITE S [GEM-T2]
FOR POINT P
- Latitude : 0.0 °
- Longitude : 0.0 °
For P: UTC = LMT + 00h 00m

APERTURE / FW : 130.0 °

(1) (2) P-S DIRECTION
△ ASC ▼ DES

Right-handed system

- Zenith angle: (1)
constant.
- Azimuth (in the
local horizontal plane) (2)
with respect to the North.

ORBIT a = 7243.700 km
Altitude = 865.6 km
Inclination = 20.00 °
Equatorial shift= 2892.0 km
Period = 101.93 min
Mean mot. = 14.13 rev/day

CONICAL SCANNING
Half-swath:
- equivalent (angle)= 42.3 °
- equiv. (ground) 841.0 km
CONICAL zen. angle = 53.1 °
Max. attained latit. = 27.6 °

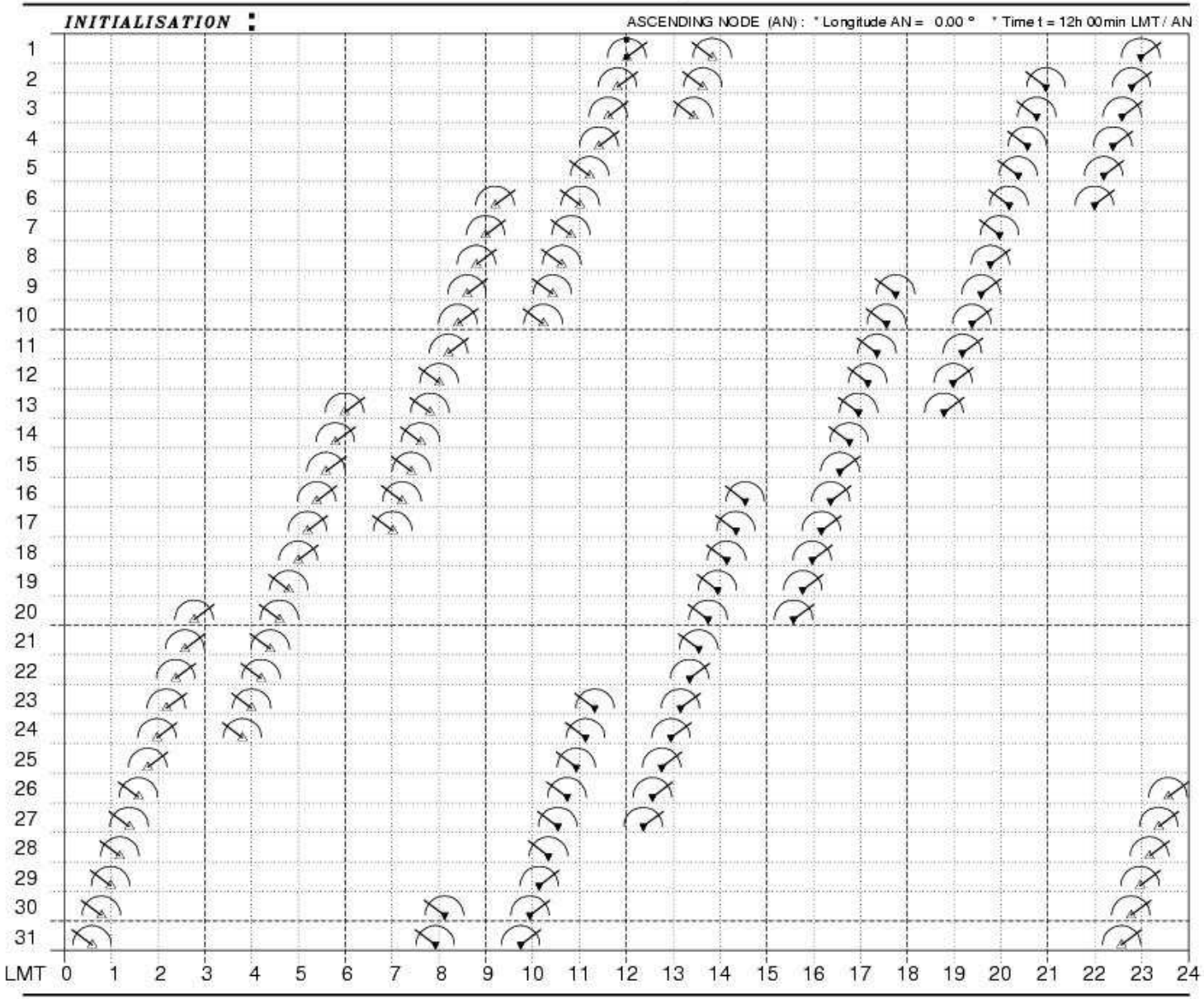
Ξιων
MC → LMD

Recurrence cycle = 7 days [14; -1; 7] 97
Precession cycle= 51 days (Cs= -51.3)
***

Megha-Trop. / MADRAS

5 ° N

MONTHLY TABLE



OVERPASSES (n = 108)
OF SATELLITE S [GEM-T2]
FOR POINT P
- Latitude : 5.0 ° N
- Longitude : 0.0 °
For P: UTC = LMT + 00h 00m

APERTURE / FW : 130.0 °

(1) P-S DIRECTION
△ ASC ▼ DES

Zenith angle of PS:
constant angle.
(1)

In the plane orthog.
to the track:
Right-handed
system.

ORBIT a = 7243.700 km
Altitude = 865.6 km
Inclination = 20.00 °
Equatorial shift= 2892.0 km
Period = 101.93 min
Mean mot. = 14.13 rev/day

CONICAL SCANNING
Half-swath:
- equivalent (angle)= 42.3 °
- equiv.(ground) 841.0 km
CONICAL zen. angle = 53.1 °
Max. attained latit. = 27.6 °

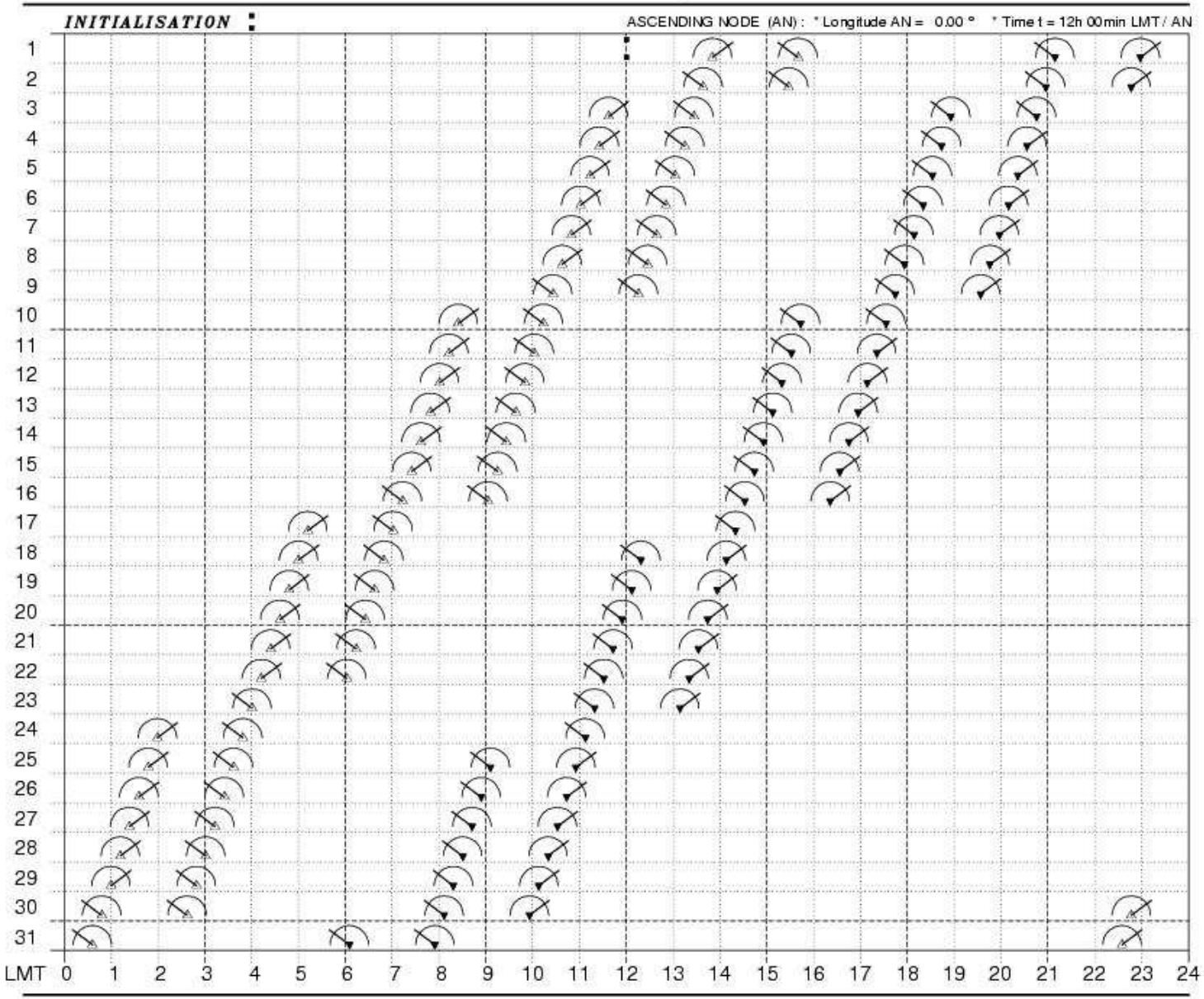
Ξιων
MC ★ LMD

Recurrence cycle = 7 days [14; -1; 7] 97
Precession cycle= 51 days (Cs= -51.3)
***

Megha-Trop. / MADRAS

10 ° N

MONTHLY TABLE



OVERPASSES (n = 122)
OF SATELLITE S [GEM-T2]
FOR POINT P
- Latitude : 10.0 ° N
- Longitude : 0.0 °
For P: UTC = LMT + 00h 00m

APERTURE / FW : 130.0 °

(1) P-S DIRECTION
△ ASC ▼ DES

Zenith angle of PS:
constant angle.
(1)

In the plane orthog.
to the track:
Right-handed
system.

ORBIT a = 7243.700 km
Altitude = 865.6 km
Inclination = 20.00 °
Equatorial shift= 2892.0 km
Period = 101.93 min
Mean mot. = 14.13 rev/day

CONICAL SCANNING
Half-swath:
- equivalent (angle)= 42.3 °
- equiv.(ground) 841.0 km
CONICAL zen. angle = 53.1 °
Max. attained latit. = 27.6 °

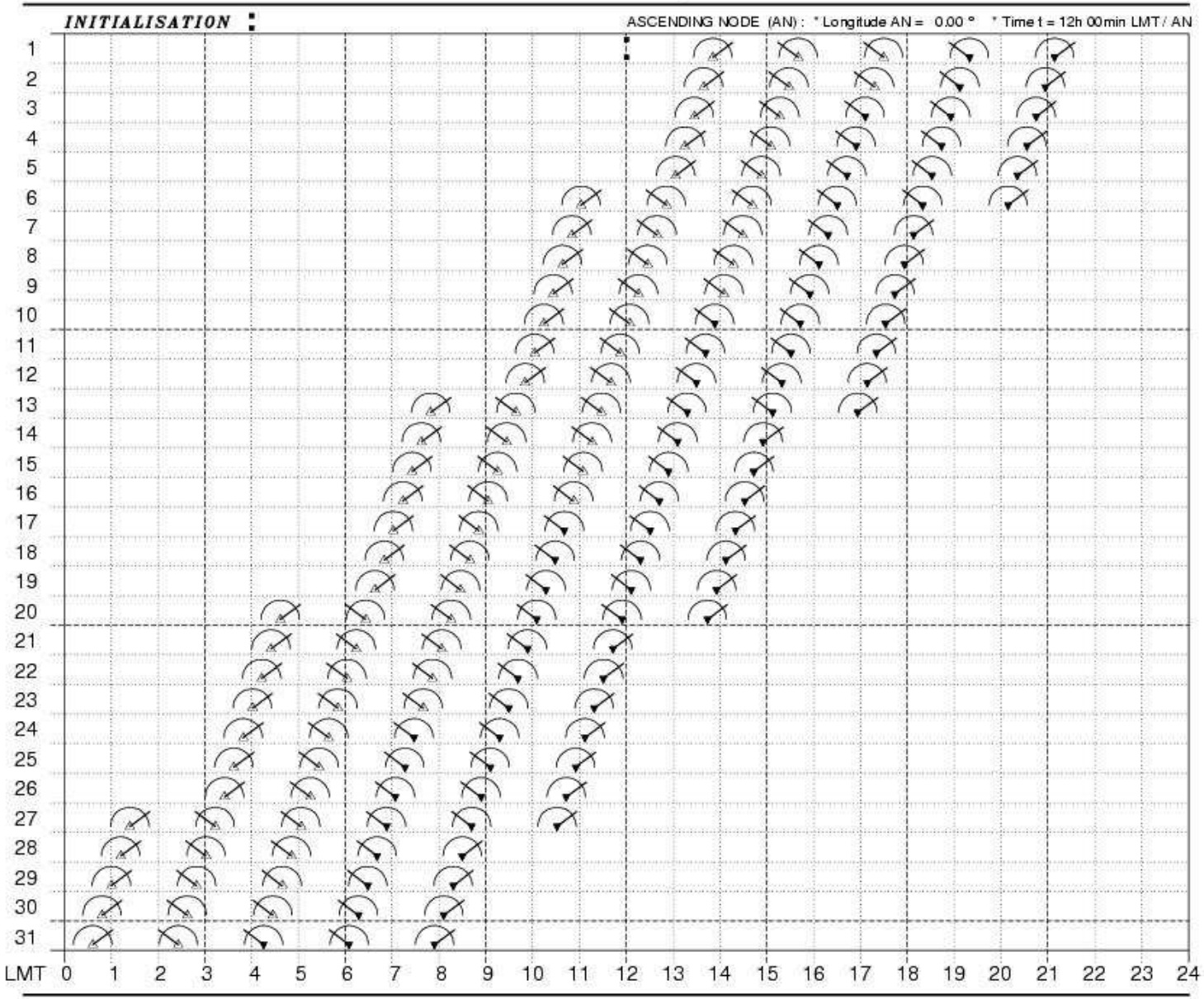
Ξιων
MC ★ LMD

Recurrence cycle = 7 days [14; -1; 7] 97
Precession cycle= 51 days (Cs= -51.3)
***

Megha-Trop. / MADRAS

15 ° N

MONTHLY TABLE



OVERPASSES (n = 159)
OF SATELLITE S [GEM-T2]
FOR POINT P
- Latitude : 15.0 ° N
- Longitude : 0.0 °
For P: UTC = LMT + 00h 00m

APERTURE / FW : 130.0 °

(1) P-S DIRECTION
△ ASC ▼ DES

Zenith angle of PS:
constant angle.
(1)

In the plane orthog.
to the track:
Right-handed
system.

ORBIT a = 7243.700 km
Altitude = 865.6 km
Inclination = 20.00 °
Equatorial shift= 2892.0 km
Period = 101.93 min
Mean mot. = 14.13 rev/day

CONICAL SCANNING
Half-swath:
- equivalent (angle)= 42.3 °
- equiv.(ground) 841.0 km
CONICAL zen. angle = 53.1 °
Max. attained latit. = 27.6 °

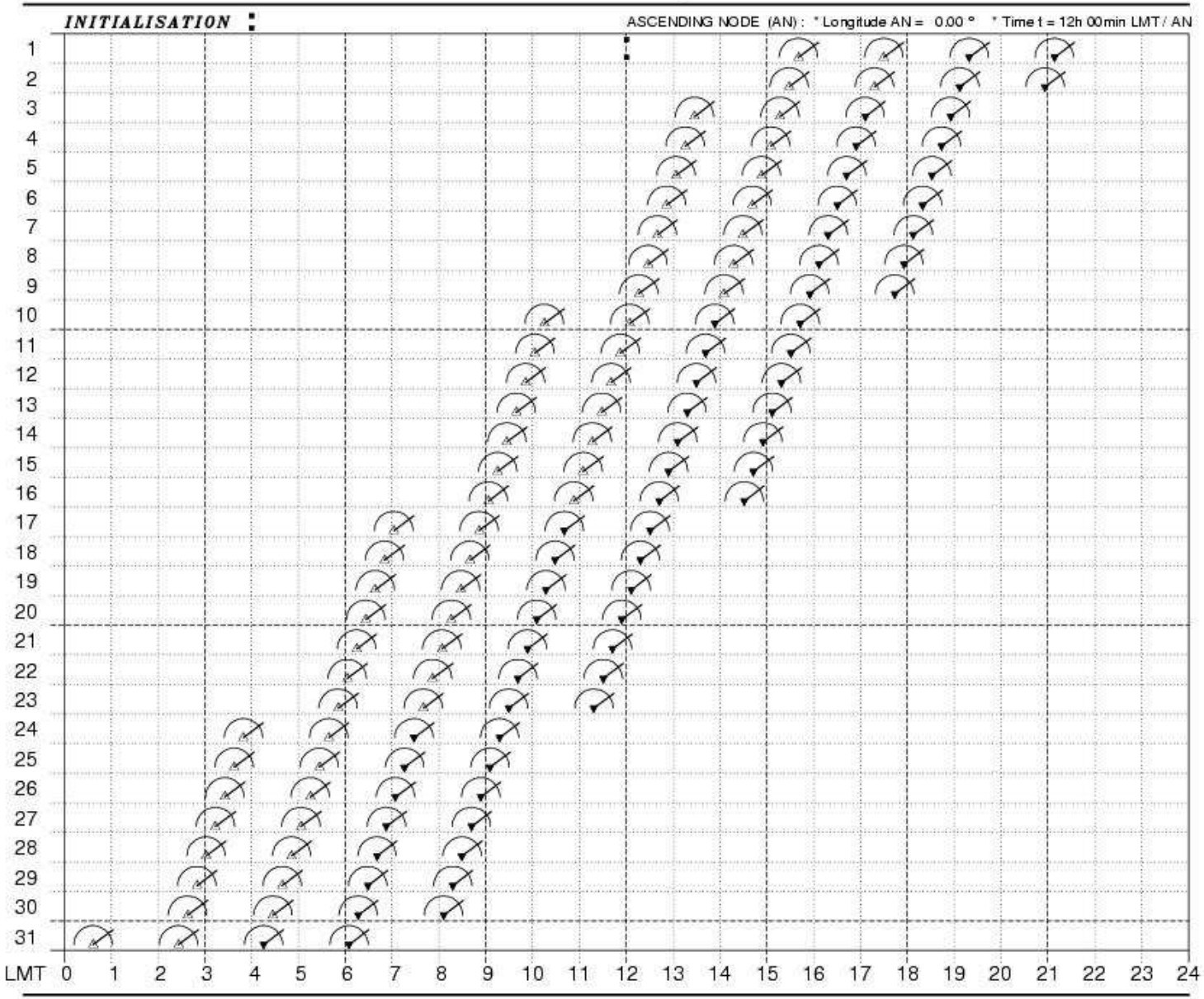
Ξιων
MC ★ LMD

Recurrence cycle = 7 days [14; -1; 7] 97
Precession cycle= 51 days (Cs= -51.3)
***

Megha-Trop. / MADRAS

20 ° N

MONTHLY TABLE



OVERPASSES (n = 124)
OF SATELLITE S [GEM-T2]
FOR POINT P
- Latitude : 20.0 ° N
- Longitude : 0.0 °
For P: UTC = LMT + 00h 00m

APERTURE / FW : 130.0 °

(1) P-S DIRECTION
△ ASC ▼ DES

Zenith angle of PS:
constant angle.
(1)
In the plane orthog.
to the track:
Right-handed
system.

ORBIT a = 7243.700 km
Altitude = 865.6 km
Inclination = 20.00 °
Equatorial shift= 2892.0 km
Period = 101.93 min
Mean mot. = 14.13 rev/day

CONICAL SCANNING
Half-swath:
- equivalent (angle)= 42.3 °
- equiv.(ground) 841.0 km
CONICAL zen. angle = 53.1 °
Max. attained latit. = 27.6 °

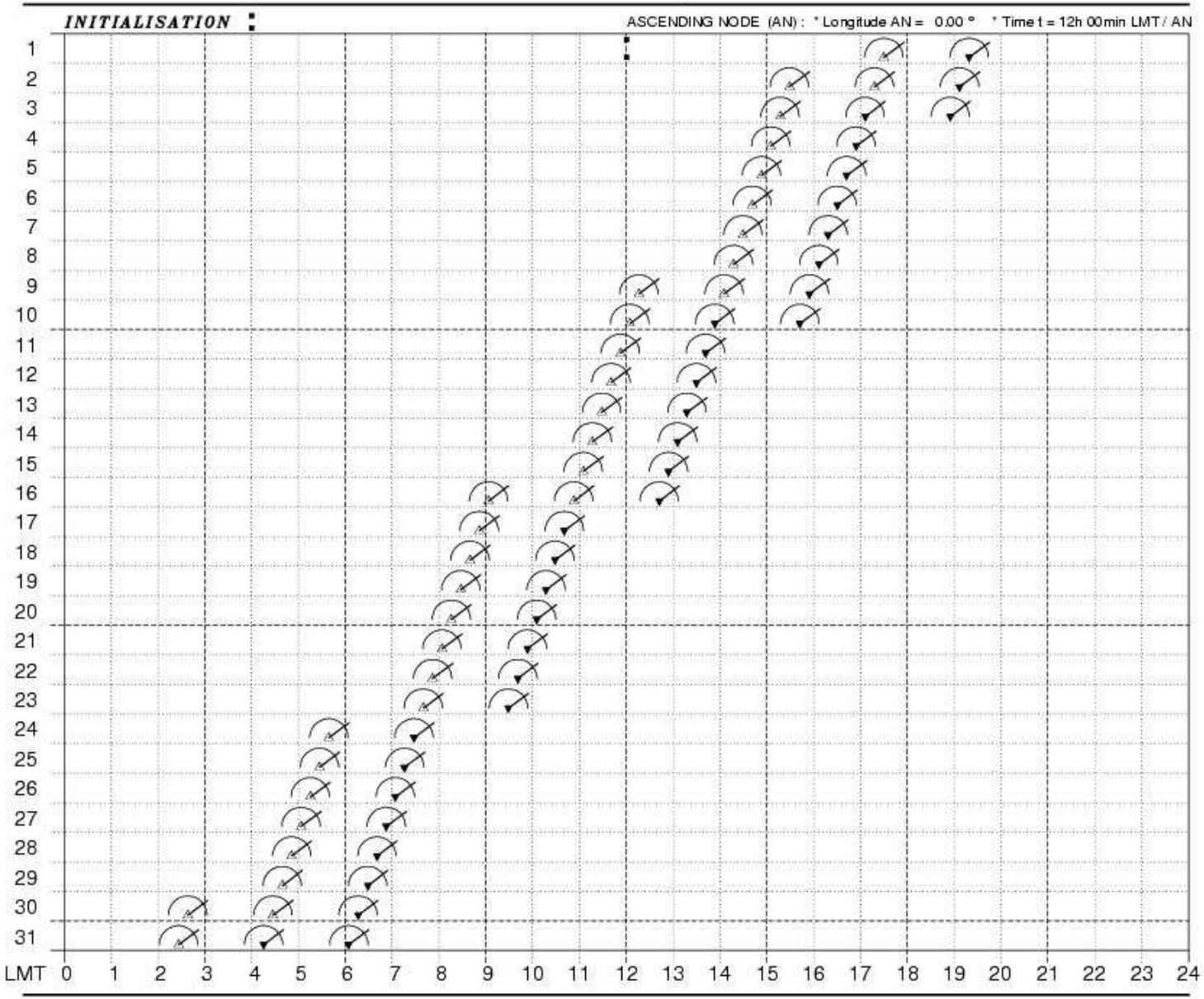
Ξιων
MC ★ LMD

Recurrence cycle = 7 days [14; -1; 7] 97
Precession cycle= 51 days (Cs= -51.3)
***

Megha-Trop. / MADRAS

25 ° N

MONTHLY TABLE



OVERPASSES (n = 69)
OF SATELLITE S [GEM-T2]
FOR POINT P
- Latitude : 25.0 ° N
- Longitude : 0.0 °
For P: UTC = LMT + 00h 00m

APERTURE / FW : 130.0 °

(1) P-S DIRECTION
△ ASC ▼ DES

Zenith angle of PS:
constant angle.
(1)

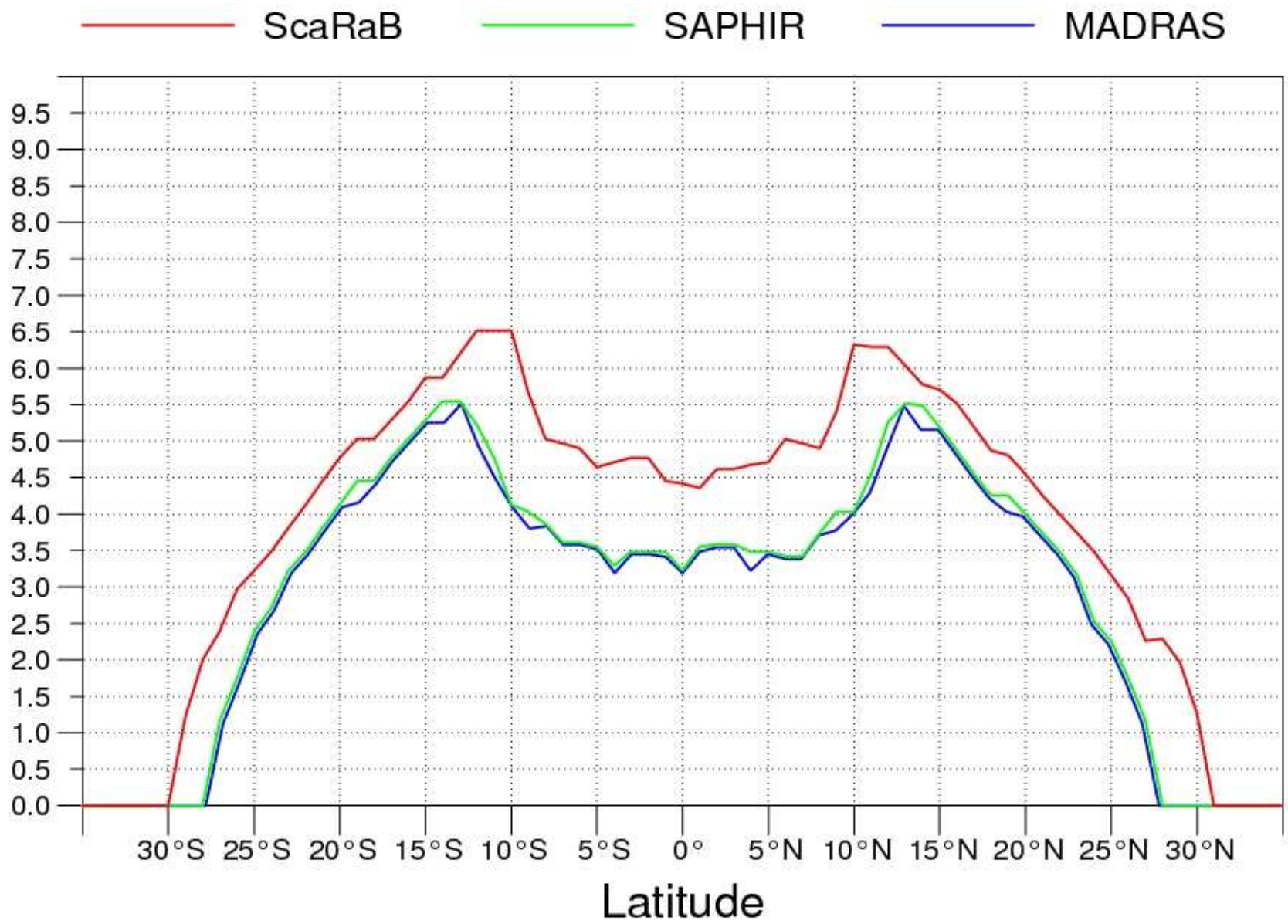
In the plane orthog.
to the track:
Right-handed
system.

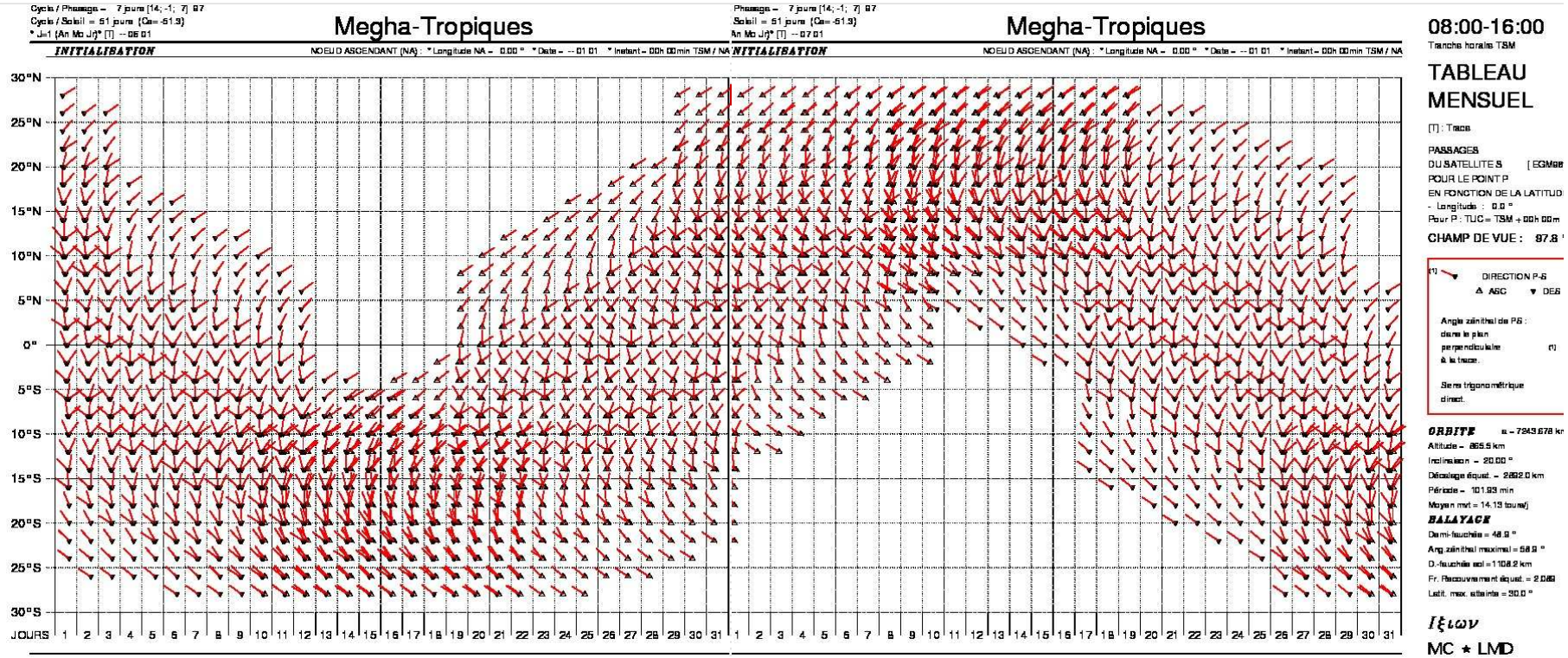
ORBIT a = 7243.700 km
Altitude = 865.6 km
Inclination = 20.00 °
Equatorial shift= 2892.0 km
Period = 101.93 min
Mean mot. = 14.13 rev/day

CONICAL SCANNING
Half-swath:
- equivalent (angle)= 42.3 °
- equiv.(ground) 841.0 km
CONICAL zen. angle = 53.1 °
Max. attained latit. = 27.6 °

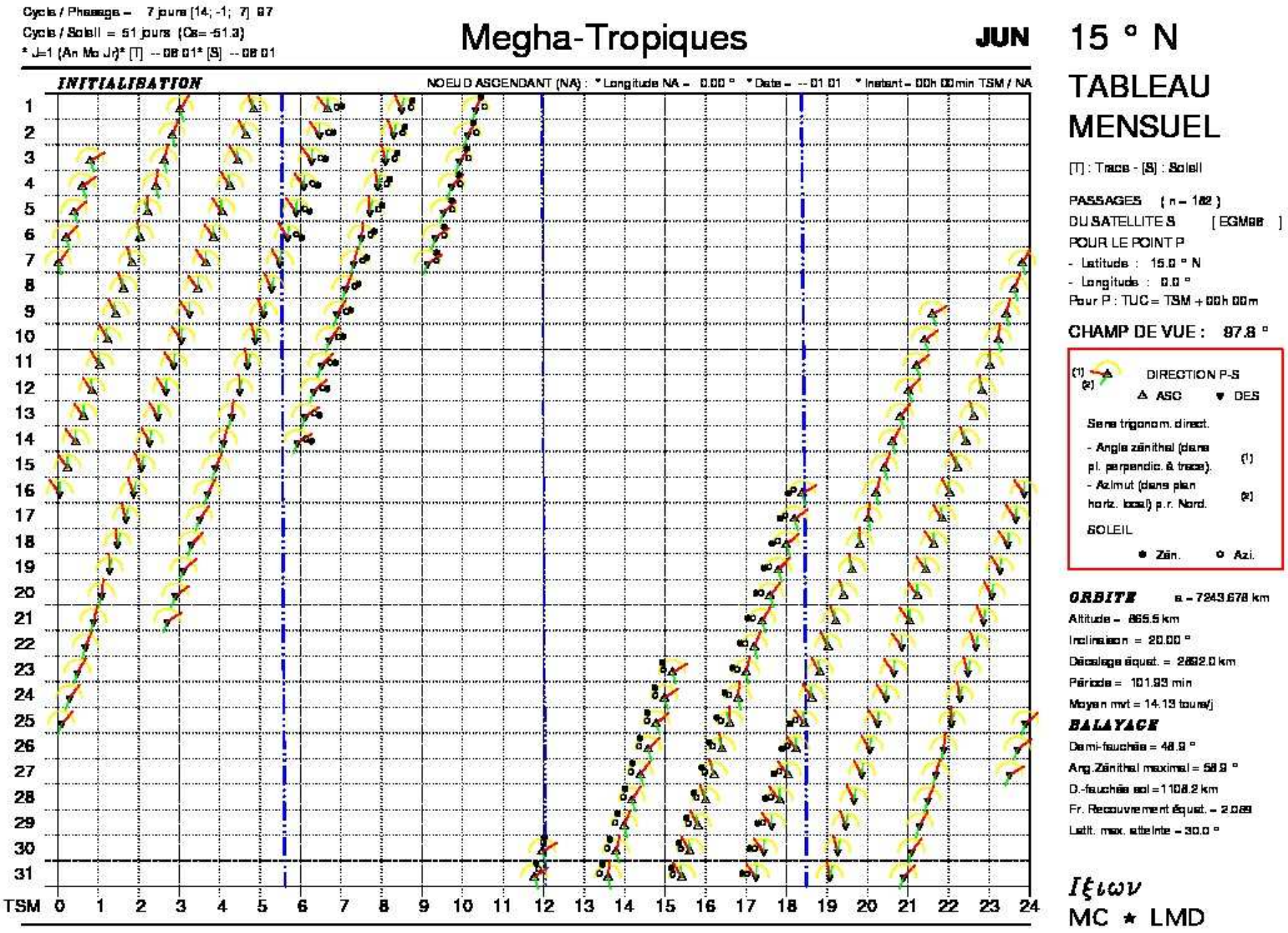
Ξιων
MC ★ LMD

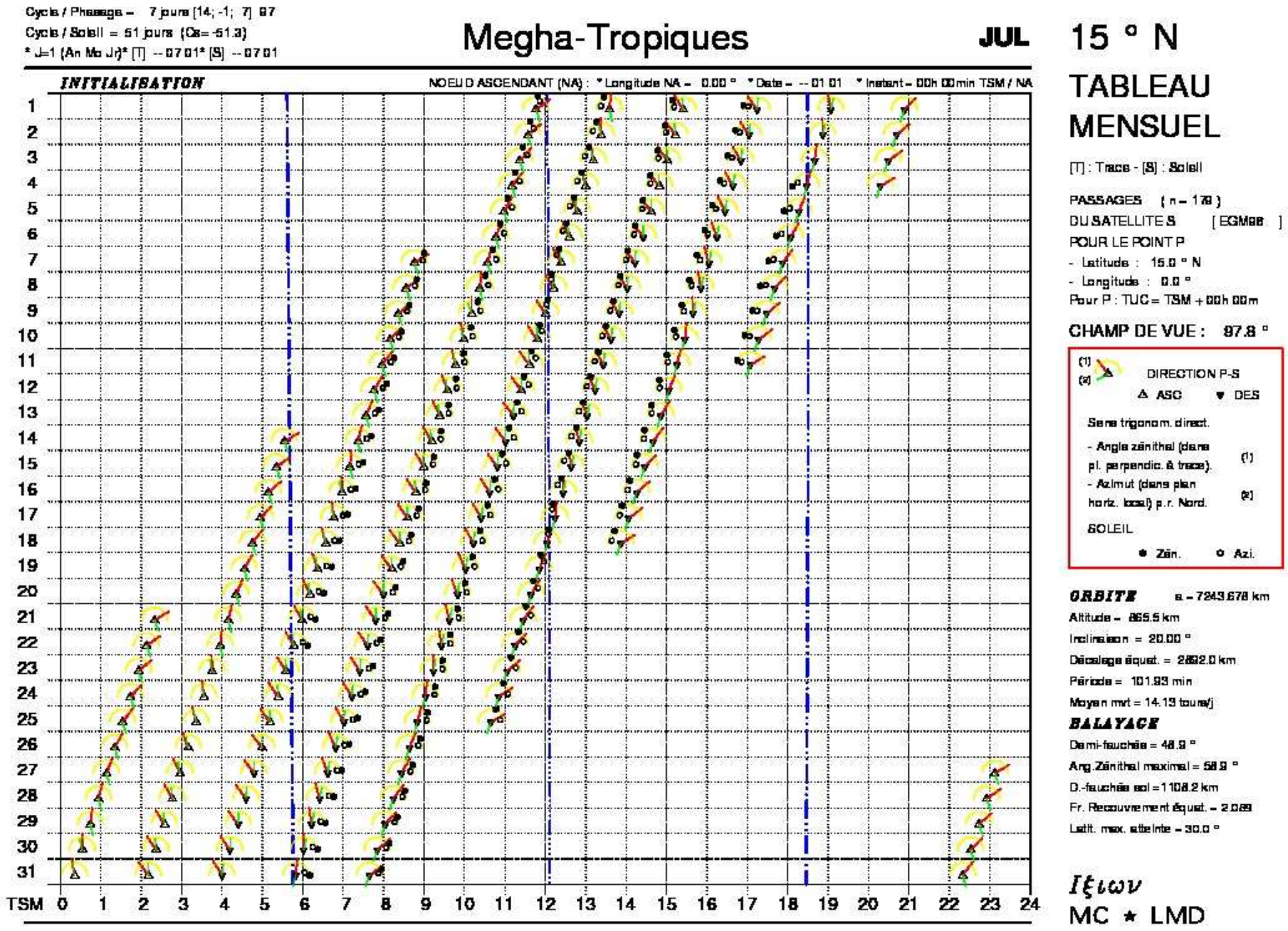
Mean number of overpass per day





Local Mean Solar Time: 51 day cycle


Cycle / Passage = 7 jours [14; -1; 7] 97
Cycle / Soleil = 51 jours (Cs= -51.3)
* J=1 (An Mo Jr)* [T] -- 08 01* [S] -- 08 01
Megha-Tropiques
JUN
15 ° N
INITIALISATION
NOEUD ASCENDANT (NA) : * Longitude NA = 0.00 ° * Date = -- 01 01 * Instant = 00h 00min TSM / NA
TABLEAU MENSUEL
[T] : Trace - [S] : Soleil
PASSAGES (n = 182)
DU SATELLITE S [EGM96]
POUR LE POINT P
- Latitude : 15.0 ° N
- Longitude : 0.0 °
Pour P : TUC = TSM + 00h 00m
CHAMP DE VUE : 97.8 °
DIRECTION P-S
ASC
DES
Sens trigonom. direct.
- Angle zénithal (dans pl. perpendic. à trace).
- Azimut (dans plan horiz. local) p.r. Nord.
SOLEIL
Zén.
Azi.
ORBITE
a = 7243.678 km
Altitude = 865.5 km
Inclinaison = 20.00 °
Décalage équat. = 2692.0 km
Période = 101.93 min
Moyen mvt = 14.13 tours/j
BALAYAGE
Demi-fauchée = 48.9 °
Ang.Zénithal maximal = 58.9 °
D.-fauchée sol = 1108.2 km
Fr. Recouvrement équat. = 2.069
Latit. max. atteinte = 30.0 °
Ιξιων
MC ★ LMD
TSM


Cycle / Passage = 7 jours [14; -1; 7] 97
Cycle / Soleil = 51 jours (Cs= -51.3)
* J=1 (An Mo Jr)* [T] -- 07 01* [S] -- 07 01
Megha-Tropiques
JUL
15 ° N
INITIALISATION
NOEUD ASCENDANT (NA) : * Longitude NA = 0.00 ° * Date = -- 01 01 * Instant = 00h 00min TSM / NA
TABLEAU MENSUEL
[T] : Trace - [S] : Soleil
PASSAGES (n = 179)
DU SATELLITE S [EGM96]
POUR LE POINT P
- Latitude : 15.0 ° N
- Longitude : 0.0 °
Pour P : TUC = TSM + 00h 00m
CHAMP DE VUE : 97.8 °
DIRECTION P-S
ASC
DES
Sens trigonom. direct.
- Angle zénithal (dans pl. perpendic. à trace). (1)
- Azimut (dans plan horiz. local) p.r. Nord. (2)
SOLEIL
Zén.
Azi.
ORBITE a = 7243.678 km
Altitude = 865.5 km
Inclinaison = 20.00 °
Décalage équat. = 2692.0 km
Période = 101.93 min
Moyen mvt = 14.13 tours/j
BALAYAGE
Demi-fauchée = 48.9 °
Ang.Zénithal maximal = 58.9 °
D.-fauchée sol = 1108.2 km
Fr. Recouvrement équat. = 2.069
Latit. max. atteinte = 30.0 °
Ιξιων
MC ★ LMD
TSM

- Scanning ground track for ***ScaRaB*** instrument

➔ Across track swath

- Scanning ground track for ***MADRAS*** instrument

➔ Conical swath

Megha-Tropiques / ScaRaB
Orbit - Ground track

Altitude = 865.5 km a = 7243.678 km

Inclination = 20.00 °

Recurrence = [14; -1; 7] 97

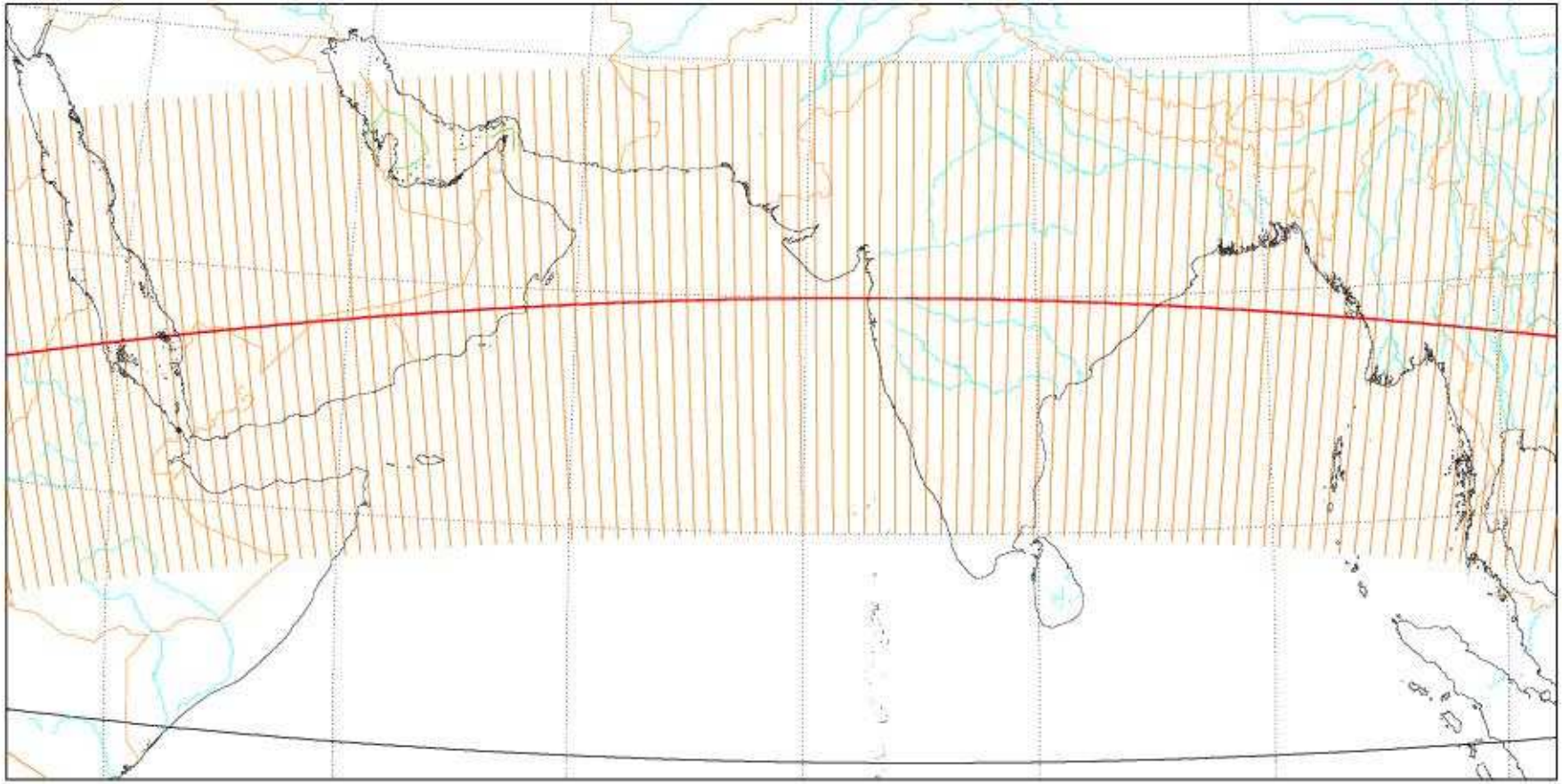
Period = 101.93 min * rev/day =14.13

>>>> Time span shown: 100.0 min = 0.07 day

Equat. orbital shift = 2892.0 km (26.0 °)

Across track swath (XT mode)

** Half-swath: 48.9° => 1108 km [0.25 min]



Projection: Raisz Armadillo MC: 0.0 ° ; 75.0 °E /ZC: 16.0 ° N; 69.0 ° E Asc. node: -10.00 ° [00:00 LMT] Ξιων

Property: none Aspect: Direct **> zoom : 4.00** App. inclin. = 21.52 ° **MC ★ LMD**

⊕ T.:(various) - Graticule: 10° {6.4} [+90.0/ +0.0/-165.0] [-] GEM-T2 Max. attained latit. = 30.0 ° Ατλας

Megha-Tropiques / MADRAS
Orbit - Ground track

Altitude = 865.5 km a = 7243.678 km

Inclination = 20.00 °

Recurrence = [14; -1; 7] 97

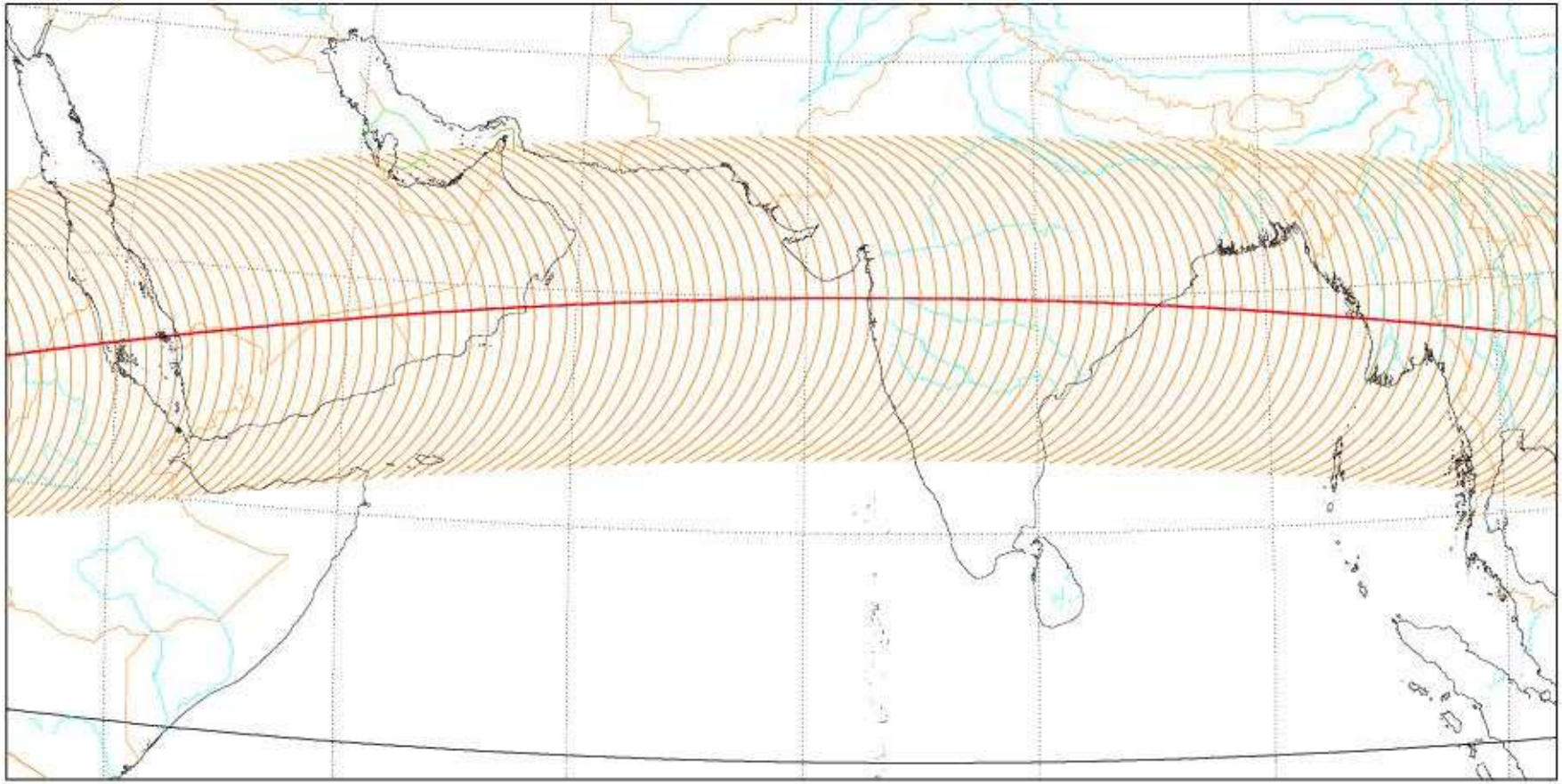
Period = 101.93 min * rev/day =14.13

>>>> Time span shown: 100.0 min = 0.07 day

Equat. orbital shift = 2892.0 km (26.0 °)

Ground track - Conical swath / VZA=53.1 °

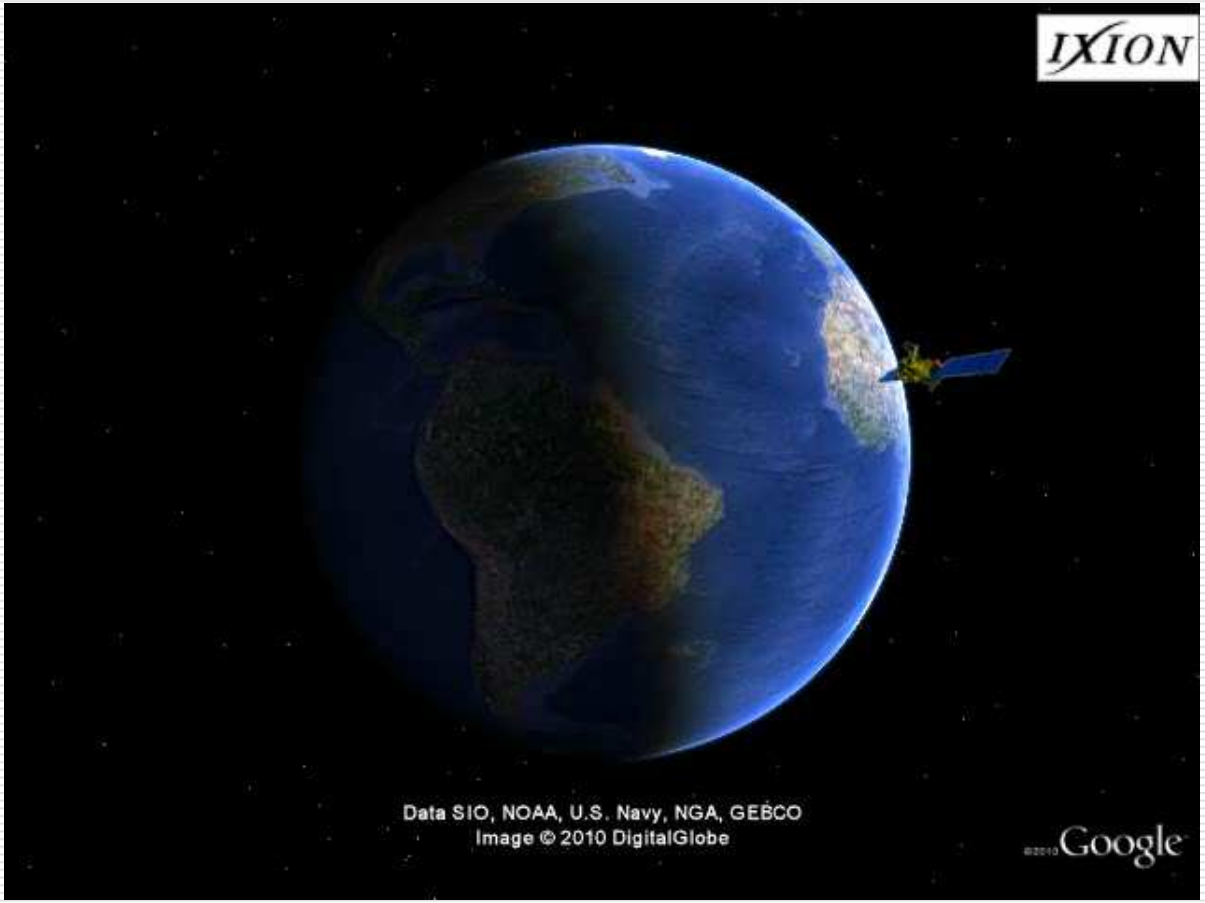
** Half-aperture: 65.0° - Radius/grnd 928 km [0.25 min]
** Effect. h-ap.: 42.3 ° => 841 km - Effect. swath: 1682 km

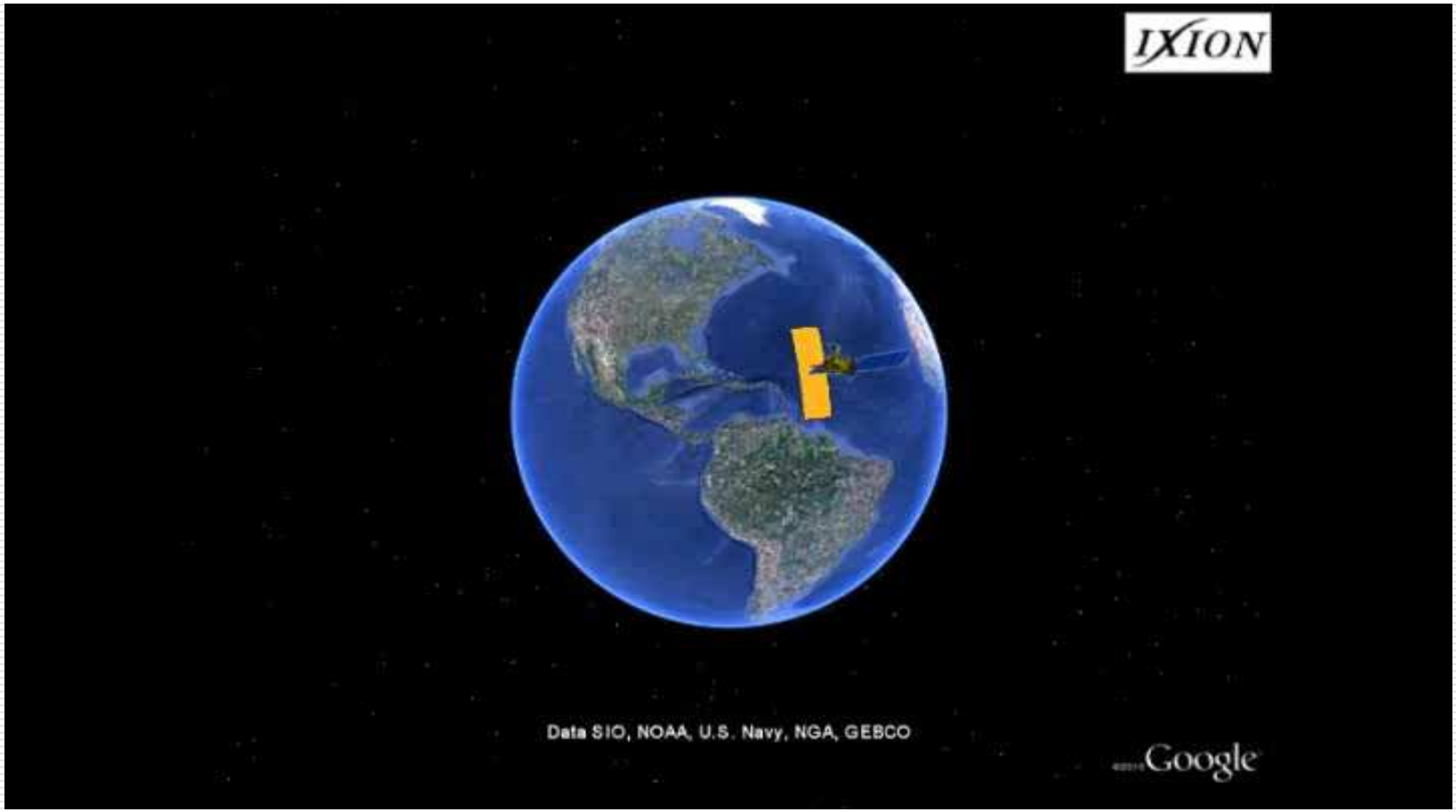


Projection: Raisz Armadillo MC: 0.0 ° ; 75.0 °E /ZC: 16.0 ° N; 69.0 ° E Asc. node: -10.00 ° [00:00 LMT] Ξιων

Property: none Aspect: Direct **> zoom : 4.00** App. inclin. = 21.52 ° **MC ★ LMD**

⊕ T.:(various) - Graticule: 10° {6.4} [+90.0/ +0.0/-165.0] [-] GEM-T2 Max. attained latit. = 27.6 ° Ατλας


IXION
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Image © 2010 DigitalGlobe
Google


IXION
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Google

Sun glint

- The situation of the MT orbit
  in the tropical belt
  implies frequent « sun glint » events

ADEOS-2 〈みどり〉

Orbit - Ground track - Sunglint [Zen: 12 / Azi: 12]

>>>> Time span shown: 202.0 min = 0.14 day

Across track swath (XT mode)

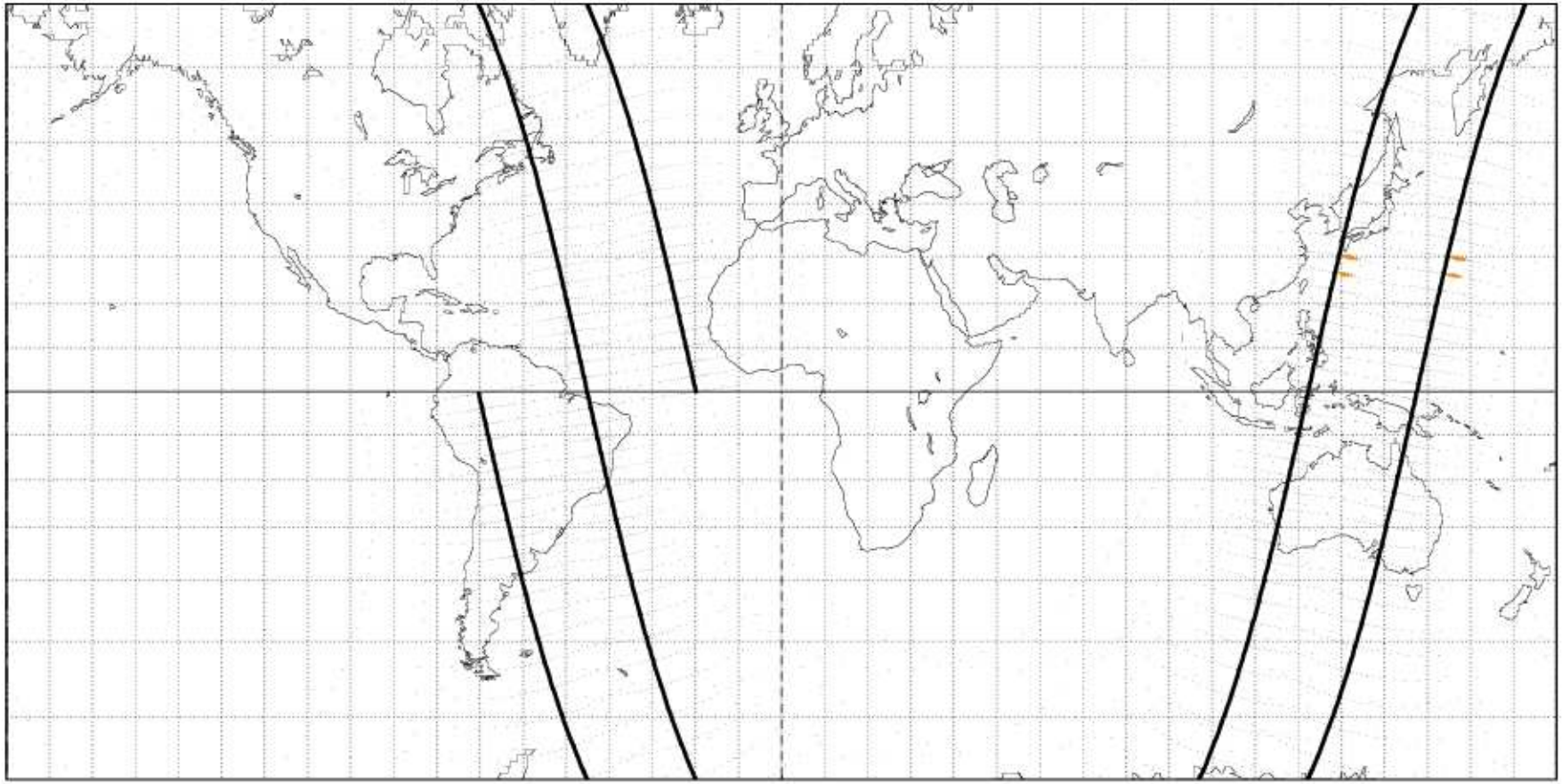
Altitude = 802.9 km a = 7181.057 km

Inclination / SUN-SYNCHRON.= 98.64 °

Period = 101.05 min * rev/day =14.25

** Half-swath: 62.6° [5.0] - On ground 3045.0 km [1.00 min]

LMT (local) 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 hours 21 JUN



Projection: Mercator Project. centre: 0.0 ° ; 0.0 ° Asc. node: -19.86 ° [22:20 LMT]

Property: Conformal Aspect: Direct

⊕ T.:Cylindrical - Graticule: 10° {4.2} [+0.0/ +0.0/ +0.0] [-] GEM-T2

Ιξιων

MC ★ LMD

Ατλας

Megha-Tropiques

Orbit - Ground track - Sunglint [Zen: 20 / Azi: 20]

>>>> Time span shown: 102.0 min = 0.07 day

Across track swath (XT mode)

Altitude = 865.5 km a = 7243.678 km

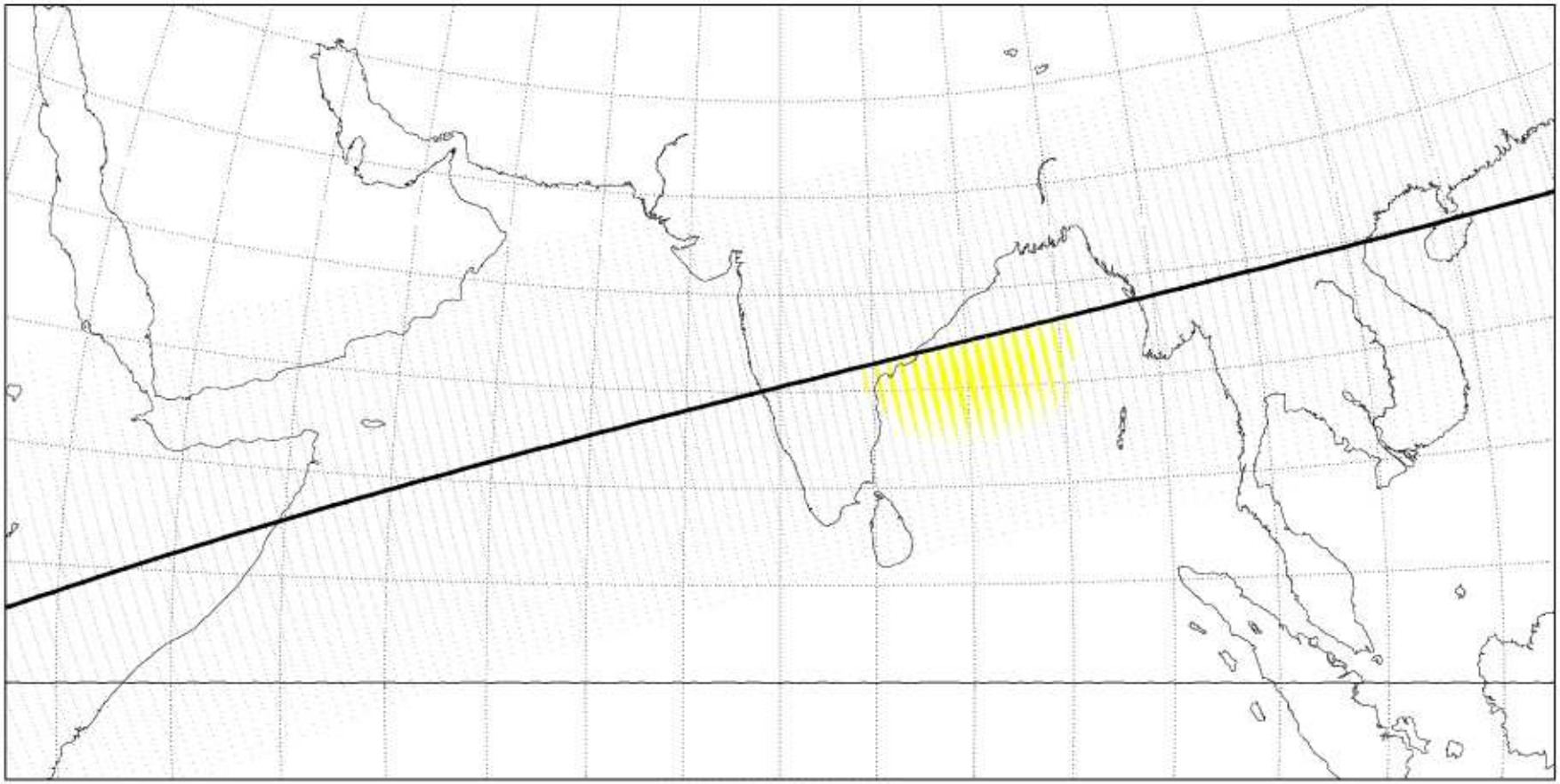
Inclination = 20.00 °

Period = 101.93 min * rev/day =14.13

** Half-swath: 48.9° [1.0] - On ground 1108.2 km [0.20 min]

Sun Elevation (deg) -90 -75 -60 -45 -30 -15 0 15 30 45 60 75 90

21 SEP



Projection: Mercator PC: 0.0 ° ; 75.0 °E /ZC: 15.0 ° N; 75.0 ° E Asc. node: 30.00 ° [08:00 LMT]

Property: Conformal Aspect: Transverse **> zoom : 4.50**

⊕ T.:Cylindrical - Graticule: 5° {5.3}[+0.0/ +90.0/ -75.0] [-90] GEM-T2

Ιξιων

MC ★ LMD

Ατλας

Megha-Tropiques

Orbit - Ground track - Sunglint [Zen: 20 / Azi: 20]

>>>> Time span shown: 102.0 min = 0.07 day

Ground track - Conical swath / VZA=53.1°

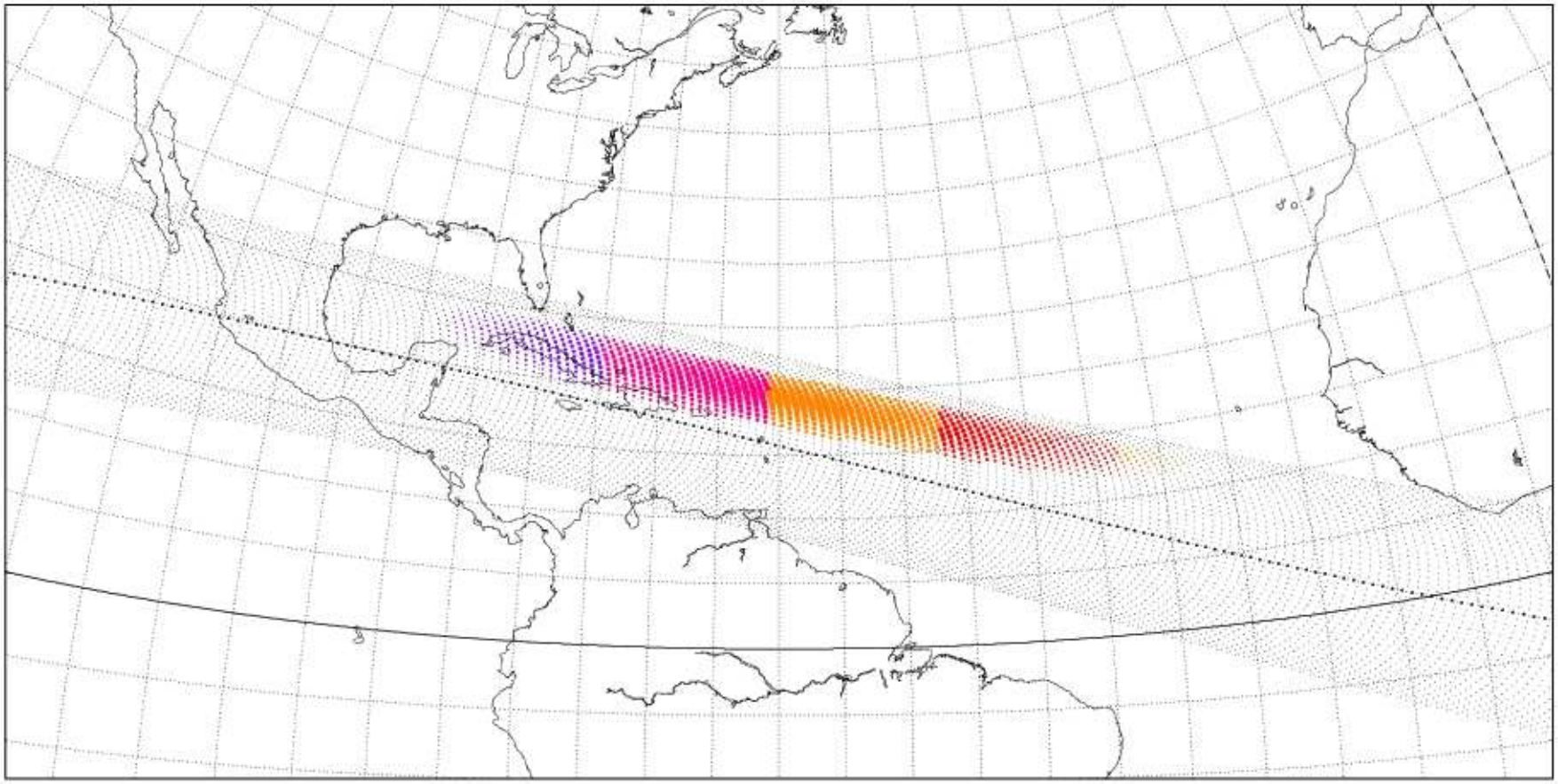
Altitude = 865.5 km a = 7243.678 km

Inclination = 20.00 °

Period = 101.93 min * rev/day =14.13

** Half-aperture: 65.0° - Radius/grnd 928 km [0.20 min]

LMT (local) 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 hours 21 JUN



Projection: Guyou

Property: Conformal

⊕ T.:(various) - Graticule: 5°

Project. centre: 20.0 ° N; 60.0 ° W

Aspect: Transverse **> zoom : 3.50**

{5.3} [-20.0/ -90.0/ +60.0] [+90] GEM-T2

Asc. node: -180.00 ° [00:00 LMT]

Ιξιων

MC ★ LMD

Ατλας

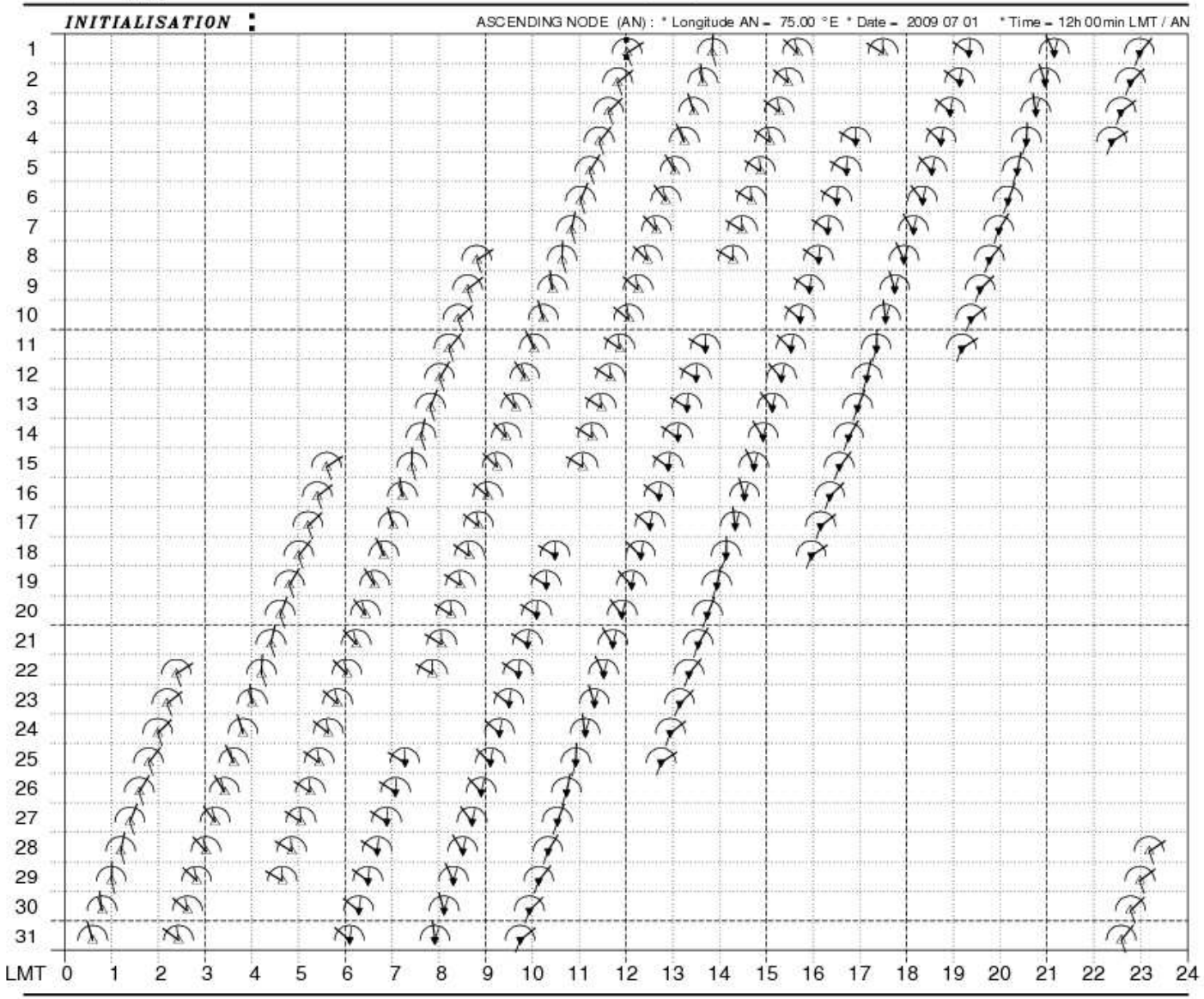
- Spatio-temporal ***Sampling***
- Angular Distribution

Recurrence cycle = 7 days [14; -1; 7] 97
Precession cycle= 51 days (Cs= -51.3)
* J=1 (Yr Mn Dy)* [T] 2009 07 01

Megha-Tropiques / ScaRaB

10 ° N

MONTHLY TABLE



[T] : Track

OVERPASSES (n = 196)
OF SATELLITE S [EGM96]
FOR POINT P
- Latitude : 10.0 ° N
- Longitude : 75.0 ° E
For P: UTC = LMT - 05h 00m

FIELD OF VIEW : 97.8 °

(1) (2) P-S DIRECTION
△ ASC ▼ DES

Right-handed system
- Zenith angle (in the plane orthogonal to the track). (1)
- Azimuth (in the local horizontal plane) with respect to the North. (2)

ORBIT a = 7243.678 km
Altitude = 865.5 km
Inclination = 20.00 °
Equatorial shift= 2892.0 km
Period = 101.93 min
Mean mot. = 14.13 rev/day

SCANNING
Half-swath = 48.9 °
Maximal zenith angle = 58.9 °
H.-swath (ground) = 1108.2 km
Equatorial overlap = 2.089
Max. attained latit. = 30.0 °

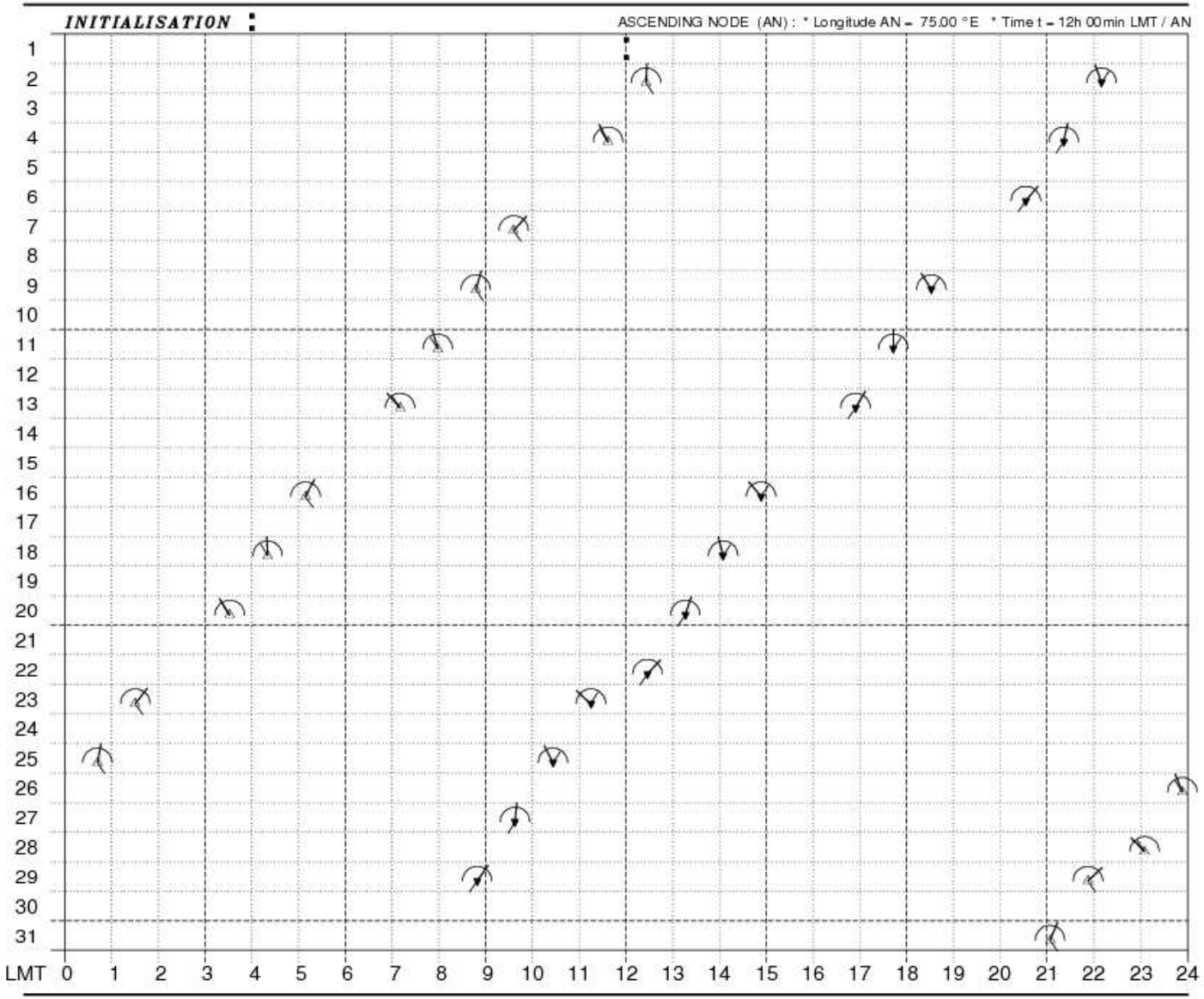
Ιξιων
MC ★ LMD

Recurrence cycle = 172 days
Precession cycle= 46 days (Cs= -46.3)
***

TRMM / CERES

10 ° N

MONTHLY TABLE



OVERPASSES (n = 29)
OF SATELLITE S [EGM96]
FOR POINT P
- Latitude : 10.0 ° N
- Longitude : 75.0 ° E
For P: UTC = LMT - 05h 00m

FIELD OF VIEW : 89.8 °

(1) (2) P-S DIRECTION
△ ASC ▼ DES

Right-handed system
- Zenith angle (in the plane orthogonal to the track). (1)
- Azimuth (in the local horizontal plane) with respect to the North. (2)

ORBIT a = 6728.216 km
Altitude = 350.1 km
Inclination = 34.99 °
Equatorial shift= 2596.2 km
Period = 91.31 min
Mean mot. = 15.77 rev/day

SCANNING
Half-swath = 44.9 °
Maximal zenith angle = 48.1 °
H.-swath (ground) = 359.3 km
Equatorial overlap = 0.457
Max. attained latit. = 38.2 °

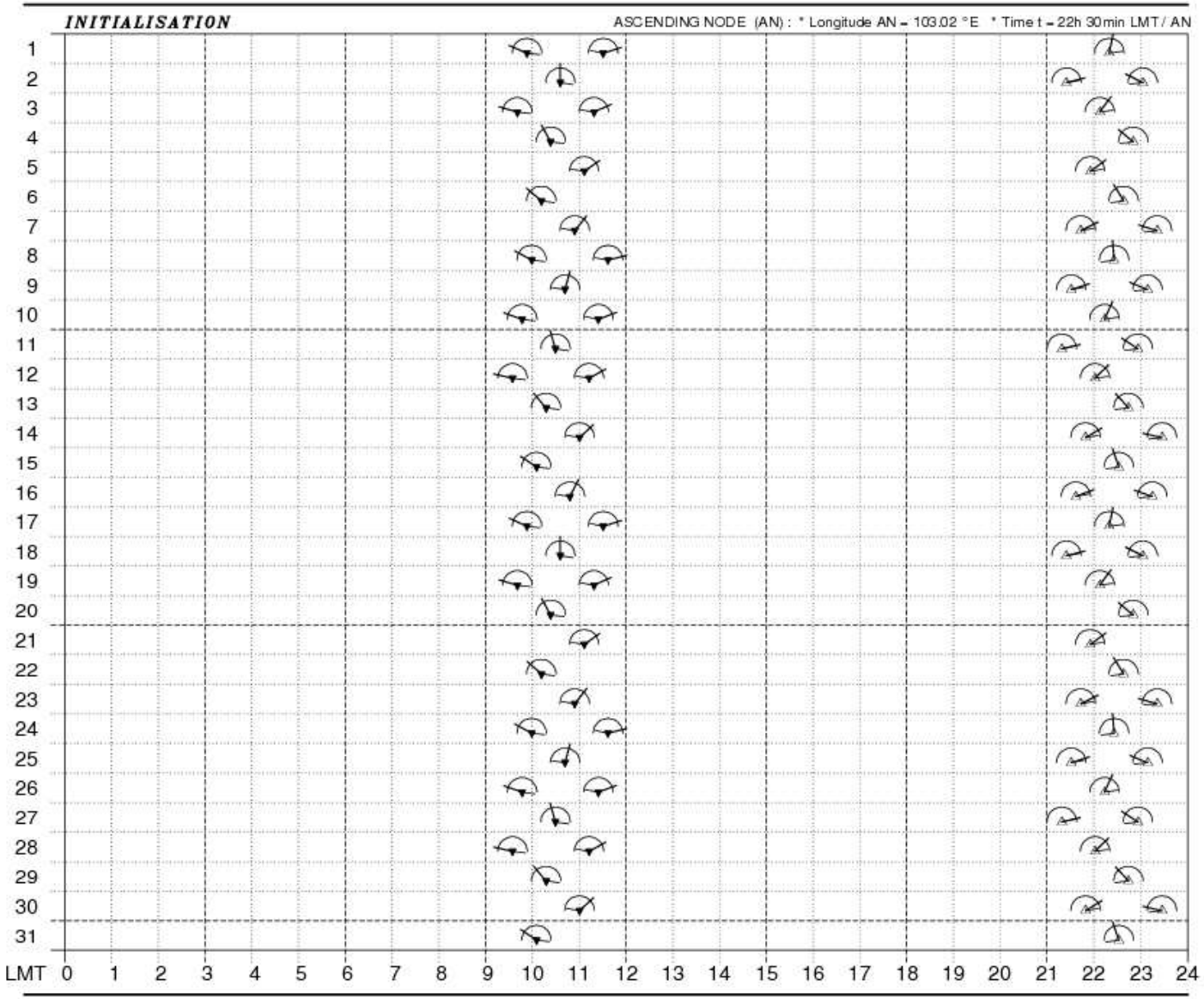
Ιξιων
MC ★ LMD

Recurrence cycle = 16 days [15; -7; 16] 233
Precession cycle: infinity (SUN-S.)
***

Terra / CERES

10 ° N

MONTHLY TABLE



OVERPASSES (n = 83)
OF SATELLITE S [EGM96]
FOR POINT P
- Latitude : 10.0 ° N
- Longitude : 75.0 ° E
For P: UTC = LMT - 05h 00m

FIELD OF VIEW : 123.6 °

(1) (2) P-S DIRECTION
△ ASC ▼ DES

Right-handed system
- Zenith angle (in the plane orthogonal to the track). (1)
- Azimuth (in the local horizontal plane) with respect to the North. (2)

ORBIT a = 7077.736 km
Altitude = 699.6 km
Incl. / Sun-s. = 98.21 °
Equatorial shift= 2751.9 km
Period = 98.88 min
Mean mot. = 14.56 rev/day

SCANNING
Half-swath = 61.8 °
Maximal zenith angle = 78.0 °
H.-swath (ground) = 1801.2 km
Equatorial overlap = 1.336
Max. attained latit. = 90.0 °
Latit. overlap:82.0° <--> 90.0°

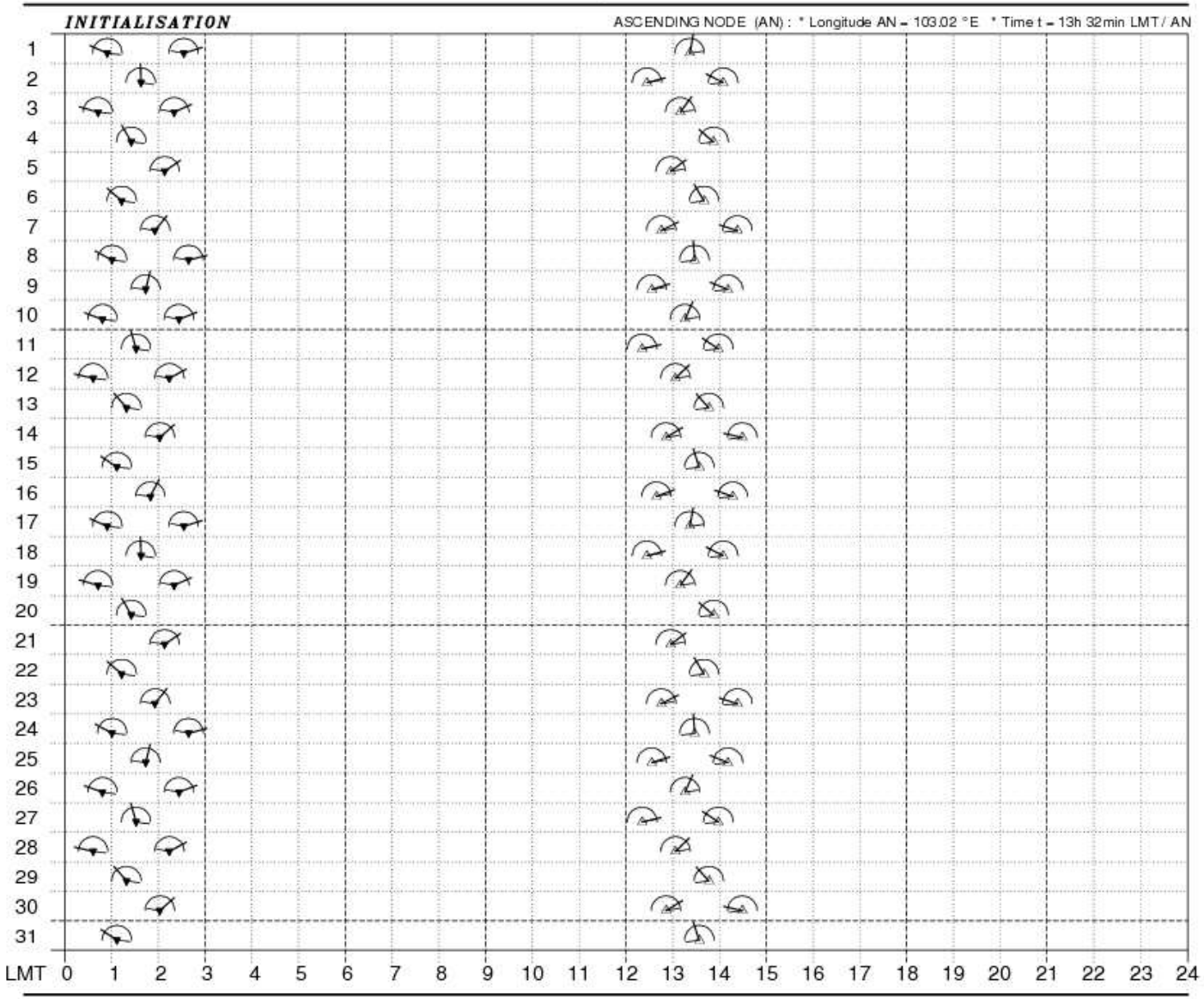
Ιξιων
MC ★ LMD

Recurrence cycle = 16 days [15; -7; 16] 233
Precession cycle: infinity (SUN-S.)
***

Aqua / CERES

10 ° N

MONTHLY TABLE



OVERPASSES (n = 83)
OF SATELLITE S [EGM96]
FOR POINT P
- Latitude : 10.0 ° N
- Longitude : 75.0 ° E
For P: UTC = LMT - 05h 00m

FIELD OF VIEW : 123.6 °

(1) (2) P-S DIRECTION
△ ASC ▼ DES

Right-handed system
- Zenith angle (in the plane orthogonal to the track). (1)
- Azimuth (in the local horizontal plane) with respect to the North. (2)

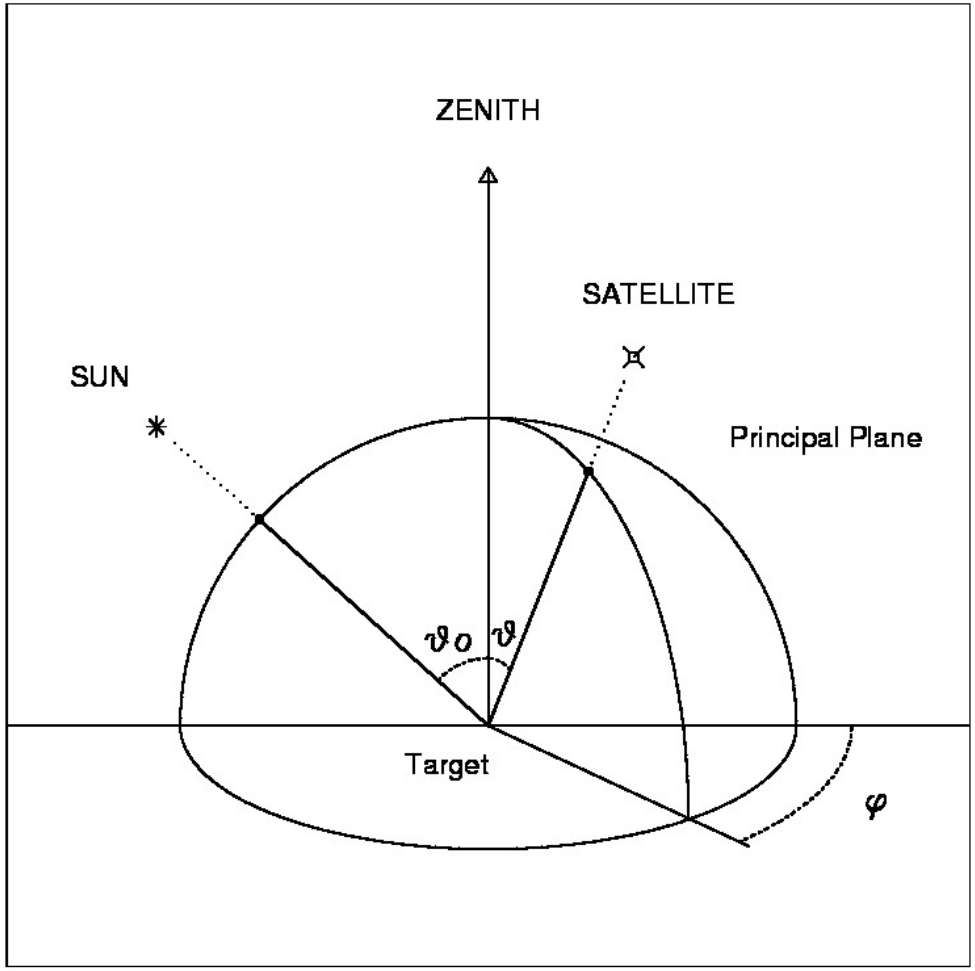
ORBIT a = 7077.736 km
Altitude = 699.6 km
Incl. / Sun-s. = 98.21 °
Equatorial shift= 2751.9 km
Period = 98.88 min
Mean mot. = 14.56 rev/day

SCANNING
Half-swath = 61.8 °
Maximal zenith angle = 78.0 °
H.-swath (ground) = 1801.2 km
Equatorial overlap = 1.336
Max. attained latit. = 90.0 °
Latit. overlap:82.0° <--> 90.0°

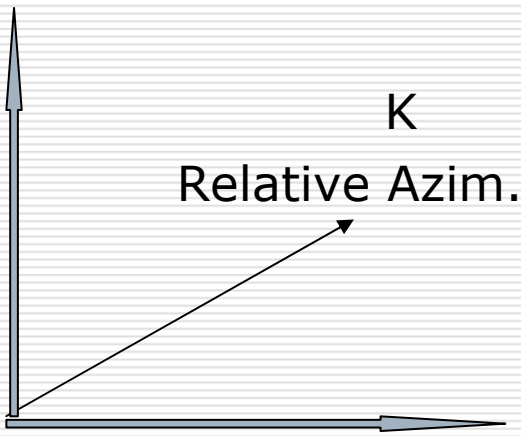
Ξιων
MC ★ LMD

Angular bins

- Angles for the Sun – Target – Satellite geometry
  - Solar Zenith Angle [0° - 90°] → I=1,2,…,9
  - Viewing Zenith Angle [0° - 90°] → J=1,2,…,9
  - Relative Azimuth [0° - 180°] → K=1,2,…,9

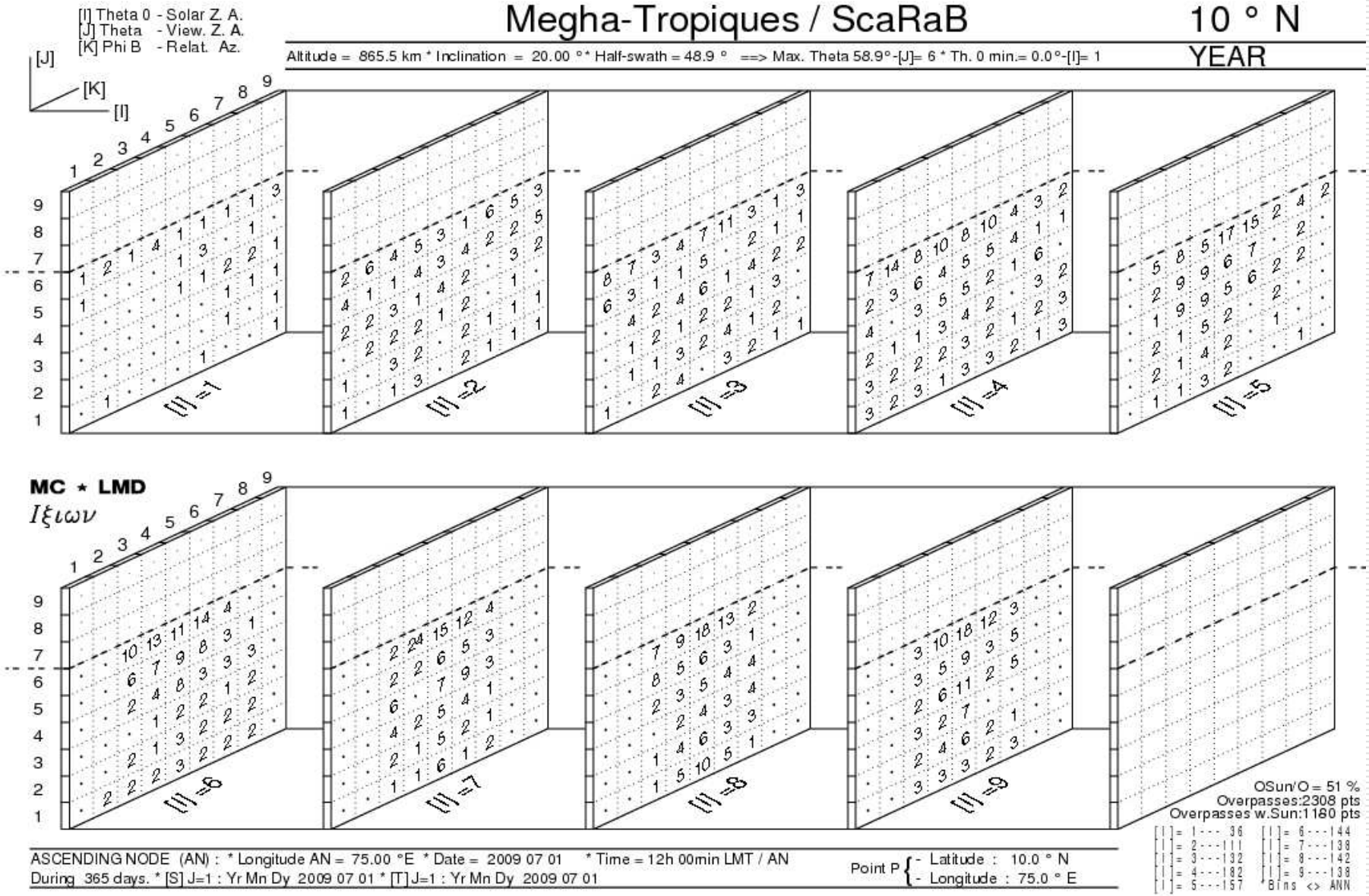


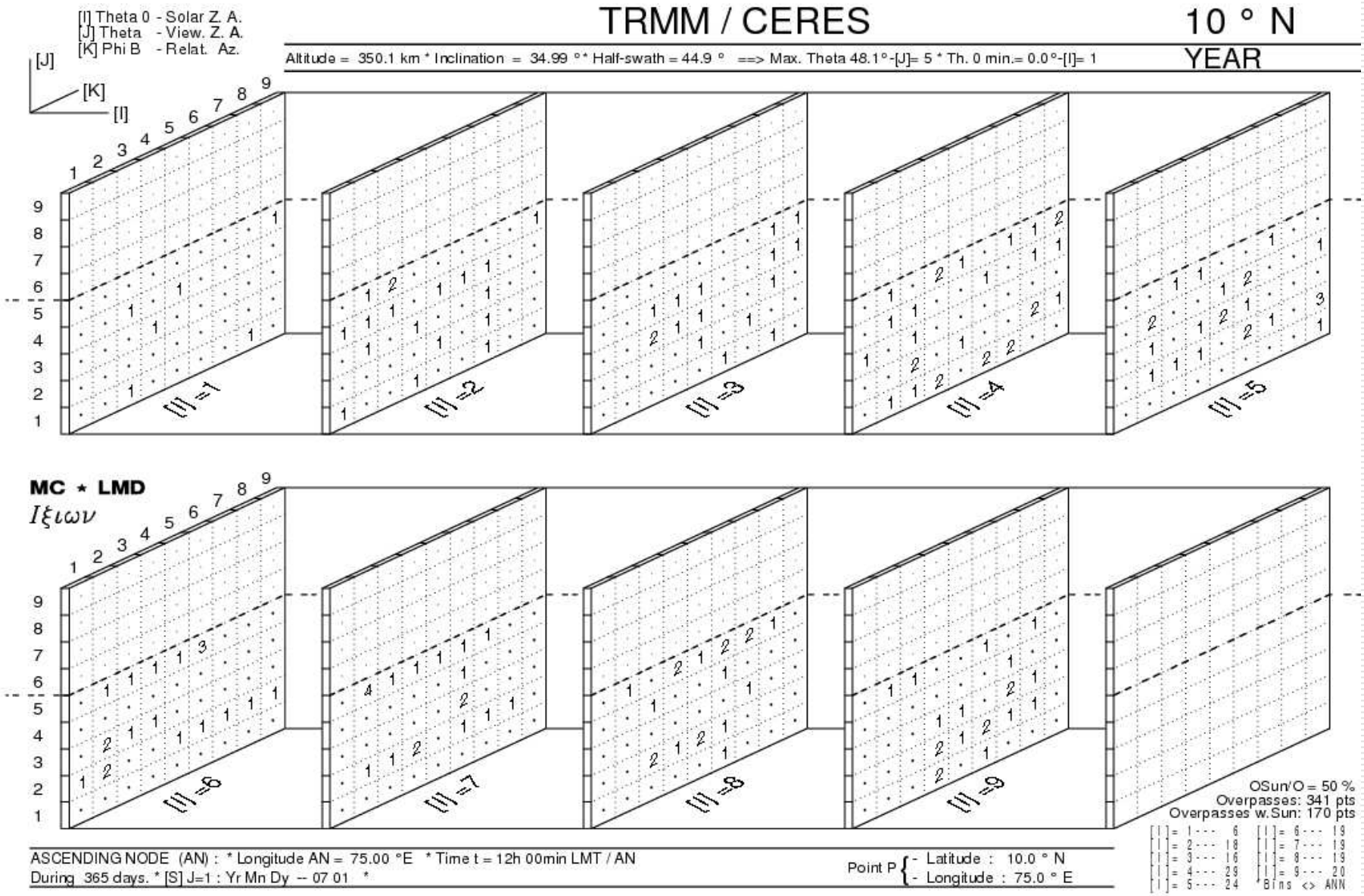
J Viewing Zenith A.

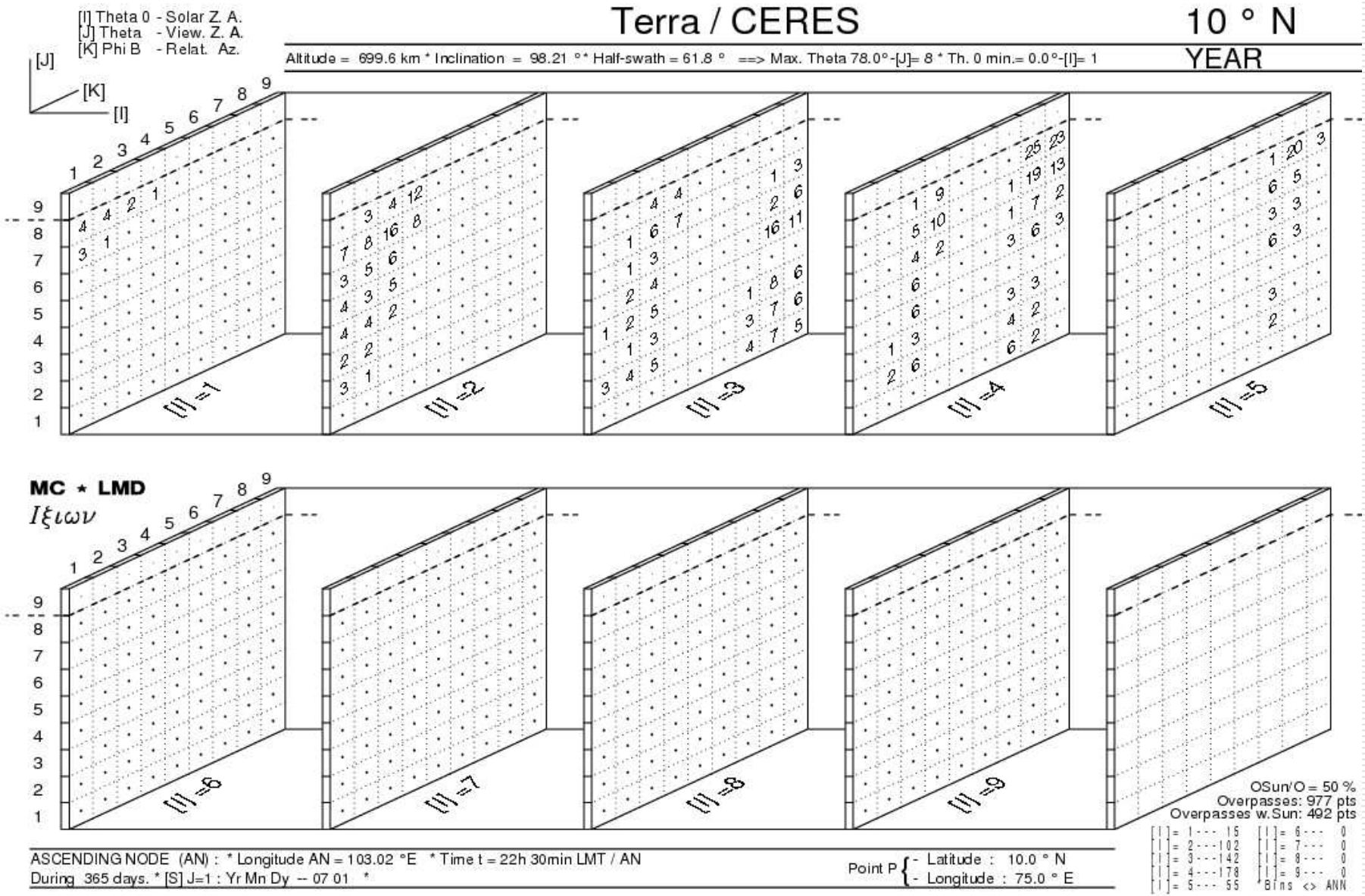


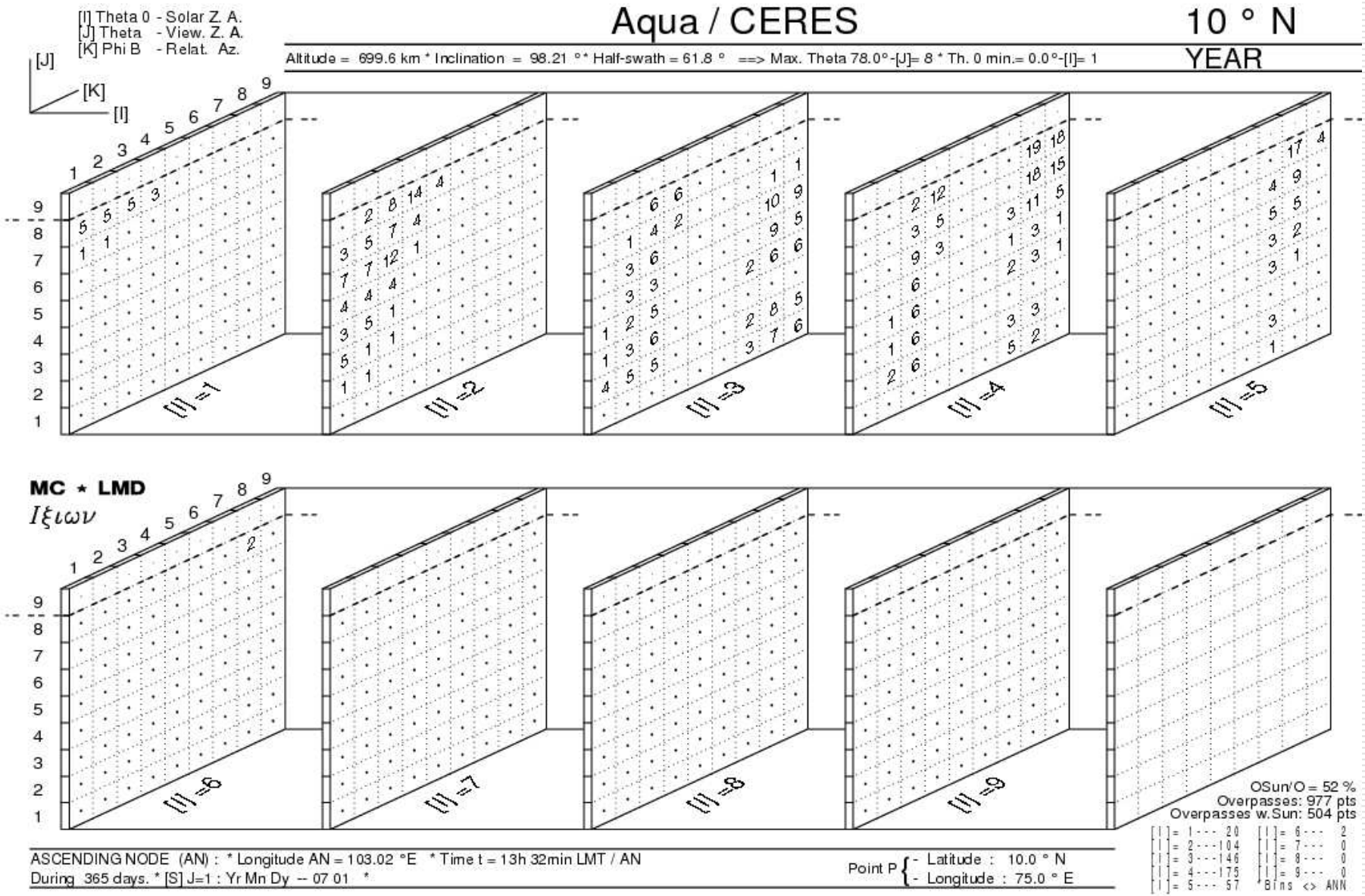
K
Relative Azim.

I
Solar Zenith A.


[I] Theta 0 - Solar Z. A.
[J] Theta - View. Z. A.
[K] Phi B - Relat. Az.
Megha-Tropiques / ScaRaB
10 ° N
YEAR
Altitude = 865.5 km * Inclination = 20.00 °* Half-swath = 48.9 ° ==> Max. Theta 58.9°-[J]= 6 * Th. 0 min.= 0.0°-[I]= 1
[I] =1
[I] =2
[I] =3
[I] =4
[I] =5
MC ★ LMD
Ιξιων
[I] =6
[I] =7
[I] =8
[I] =9
OSun/O = 51 %
Overpasses:2308 pts
Overpasses w.Sun:1180 pts
[I]= 1---36 [I]= 6---144
[I]= 2---111 [I]= 7---138
[I]= 3---132 [I]= 8---142
[I]= 4---182 [I]= 9---138
[I]= 5---157 Bins <> ANN
ASCENDING NODE (AN) : * Longitude AN = 75.00 °E * Date = 2009 07 01 * Time = 12h 00min LMT / AN
During 365 days. * [S] J=1 : Yr Mn Dy 2009 07 01 * [T] J=1 : Yr Mn Dy 2009 07 01
Point P - Latitude : 10.0 ° N
- Longitude : 75.0 ° E


[I] Theta 0 - Solar Z. A.
[J] Theta - View. Z. A.
[K] Phi B - Relat. Az.
TRMM / CERES
10 ° N
YEAR
Altitude = 350.1 km * Inclination = 34.99 °* Half-swath = 44.9 ° ==> Max. Theta 48.1°-[J]= 5 * Th. 0 min.= 0.0°-[I]= 1
[I] =1
[I] =2
[I] =3
[I] =4
[I] =5
MC ★ LMD
Ιξιων
[I] =6
[I] =7
[I] =8
[I] =9
OSun/O = 50 %
Overpasses: 341 pts
Overpasses w.Sun: 170 pts
[I]= 1--- 6
[I]= 2--- 18
[I]= 3--- 16
[I]= 4--- 29
[I]= 5--- 24
[I]= 6--- 19
[I]= 7--- 19
[I]= 8--- 19
[I]= 9--- 20
Bins <> ANN
ASCENDING NODE (AN) : * Longitude AN = 75.00 °E * Time t = 12h 00min LMT / AN
During 365 days. * [S] J=1 : Yr Mn Dy -- 07 01 *
Point P
- Latitude : 10.0 ° N
- Longitude : 75.0 ° E


[I] Theta 0 - Solar Z. A.
[J] Theta - View. Z. A.
[K] Phi B - Relat. Az.
Terra / CERES
10 ° N
YEAR
Altitude = 699.6 km * Inclination = 98.21 °* Half-swath = 61.8 ° ==> Max. Theta 78.0°-[J]= 8 * Th. 0 min.= 0.0°-[I]= 1
[I] =1
[I] =2
[I] =3
[I] =4
[I] =5
MC ★ LMD
Ιξιων
[I] =6
[I] =7
[I] =8
[I] =9
OSun/O = 50 %
Overpasses: 977 pts
Overpasses w.Sun: 492 pts
[I]= 1 --- 15
[I]= 2 ---102
[I]= 3 ---142
[I]= 4 ---178
[I]= 5 --- 55
[I]= 6 --- 0
[I]= 7 --- 0
[I]= 8 --- 0
[I]= 9 --- 0
Bins <> ANN
ASCENDING NODE (AN) : * Longitude AN = 103.02 °E * Time t = 22h 30min LMT / AN
During 365 days. * [S] J=1 : Yr Mn Dy -- 07 01 *
Point P - Latitude : 10.0 ° N
- Longitude : 75.0 ° E


[I] Theta 0 - Solar Z. A.
[J] Theta - View. Z. A.
[K] Phi B - Relat. Az.
Aqua / CERES
10 ° N
YEAR
Altitude = 699.6 km * Inclination = 98.21 °* Half-swath = 61.8 ° ==> Max. Theta 78.0°-[J]= 8 * Th. 0 min.= 0.0°-[I]= 1
[I] =1
[I] =2
[I] =3
[I] =4
[I] =5
MC ★ LMD
Ιξιων
[I] =6
[I] =7
[I] =8
[I] =9
OSun/O = 52 %
Overpasses: 977 pts
Overpasses w.Sun: 504 pts
[I] = 1 --- 20
[I] = 2 --- 104
[I] = 3 --- 146
[I] = 4 --- 175
[I] = 5 --- 57
[I] = 6 --- 2
[I] = 7 --- 0
[I] = 8 --- 0
[I] = 9 --- 0
Bins <> ANN
ASCENDING NODE (AN) : * Longitude AN = 103.02 °E * Time t = 13h 32min LMT / AN
During 365 days. * [S] J=1 : Yr Mn Dy -- 07 01 *
Point P - Latitude : 10.0 ° N
- Longitude : 75.0 ° E

GPM

- ***GPM*** Global Precipitation Mission

Conical swath

→ Exemple with:

- Two Sun-Synchronous satellites
  * DMSP (1)
  * DMSP (2)
- Two « tropical » satellites
  * Megha-Tropiques
  * TRMM (Tropical Rainfall Mission Measurement)

Megha-Tropiques
Orbit - Ground track

Altitude = 865.5 km a = 7243.678 km

Inclination = 20.00 °

Recurrence = [14; -1; 7] 97

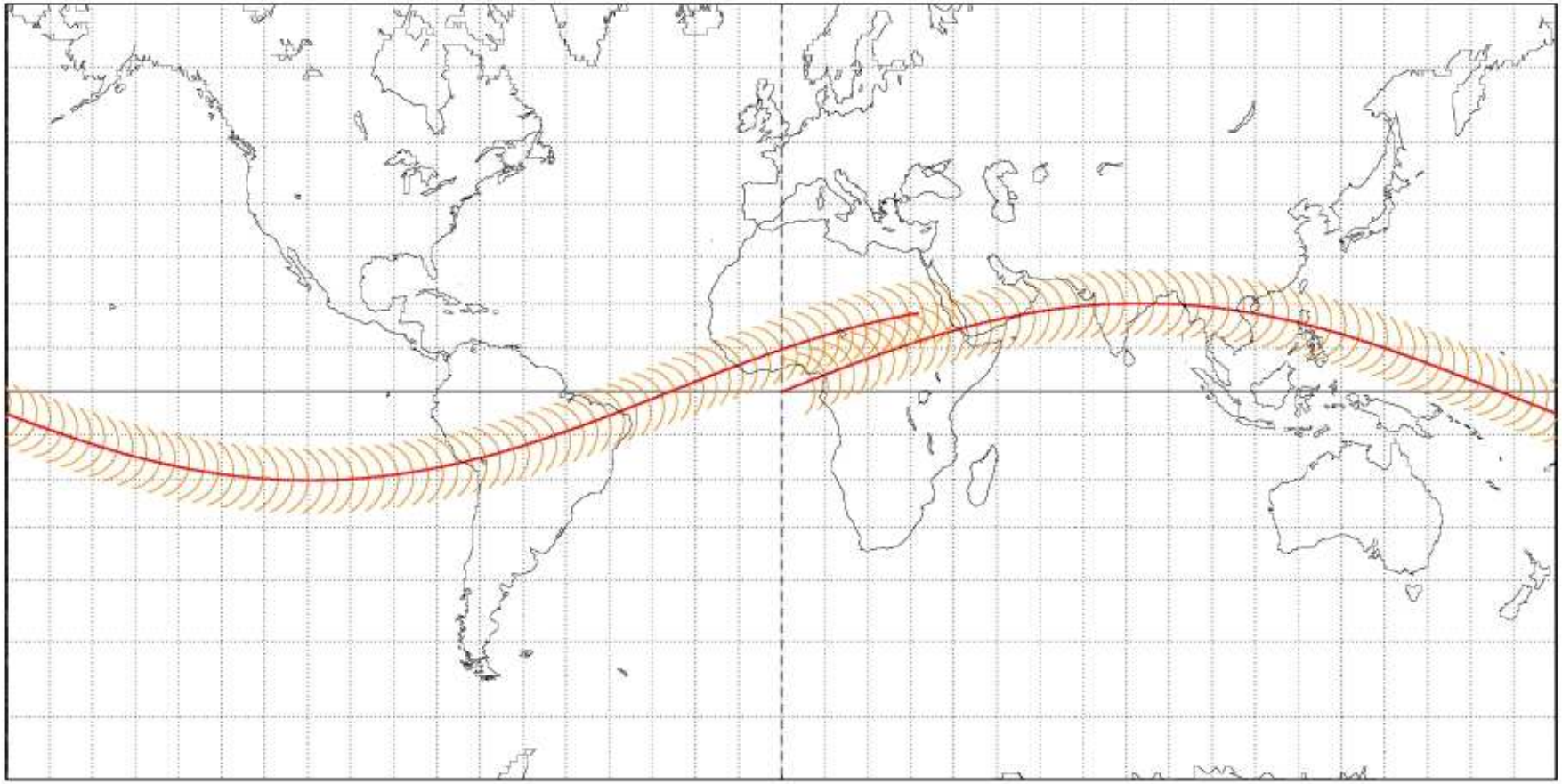
Period = 101.93 min * rev/day =14.13

>>>> Time span shown: 120.0 min = 0.08 day

Equat. orbital shift = 2892.0 km (26.0 °)

Ground track - Conical swath / VZA=53.5°

** Half-aperture: 65.0° - Radius/grnd 940 km [1.00 min]
** Effect. h-ap.: 42.6 ° => 851 km - Effect. swath: 1703 km



Projection: Mercator Project. centre: 0.0 ° ; 0.0 ° Asc. node: 0.00 °

Property: Conformal Aspect: Direct Max. attained latit. = 27.6 °

⊕ T.:Cylindrical - Graticule: 10° {4.2} [+0.0/ +0.0/ +0.0] [-] EGM96

Ιξιων
MC ★ LMD
Ατλας

TRMM [2] 〈 降雨 〉
Orbit - Ground track

>>>> Time span shown: 120.0 min = 0.08 day

Ground track - Conical swath / VZA=52.8°

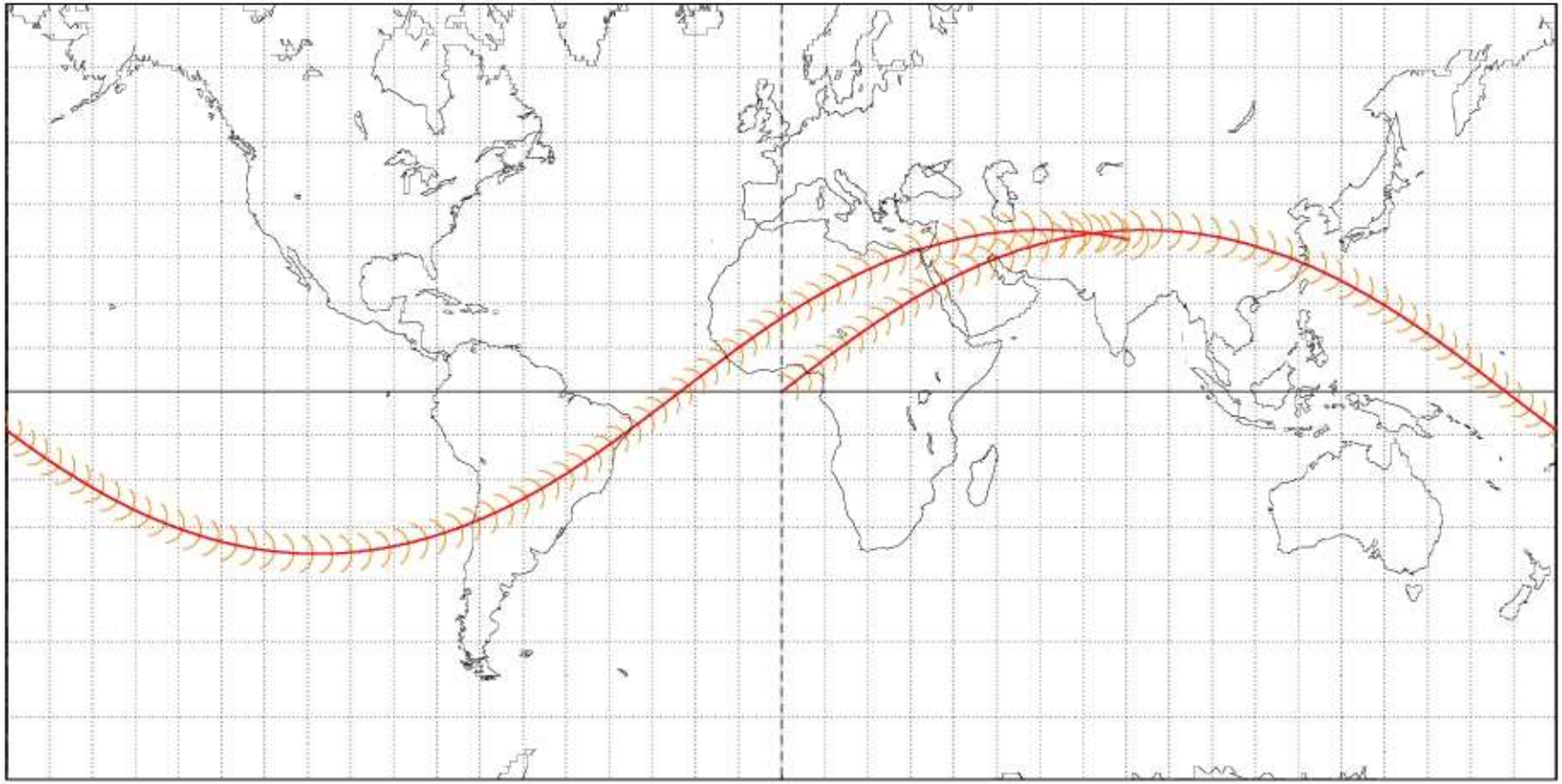
Altitude = 402.6 km a = 6780.729 km

Inclination = 34.97 °

Period = 92.39 min * rev/day =15.59

Equat. orbital shift = 2625.4 km (23.6 °)

** Half-aperture: 64.8° - Radius/grnd 476 km [1.00 min]
** Effect. h-ap.: 45.9 ° => 431 km - Effect. swath: 861 km



Projection: Mercator
Property: Conformal
⊕ T.:Cylindrical - Graticule: 10°

Project. centre: 0.0 ° ; 0.0 °
Aspect: Direct
{4.2}[+0.0/ +0.0/ +0.0] [-] EGM96

Asc. node: 0.00 °
Max. attained latit. = 38.8 °

Ιξιων
MC ★ LMD
Ατλας

DMSP-F-17
Orbit - Ground track

>>>> Time span shown: 120.0 min = 0.08 day

Ground track - Conical swath / VZA=53.1°

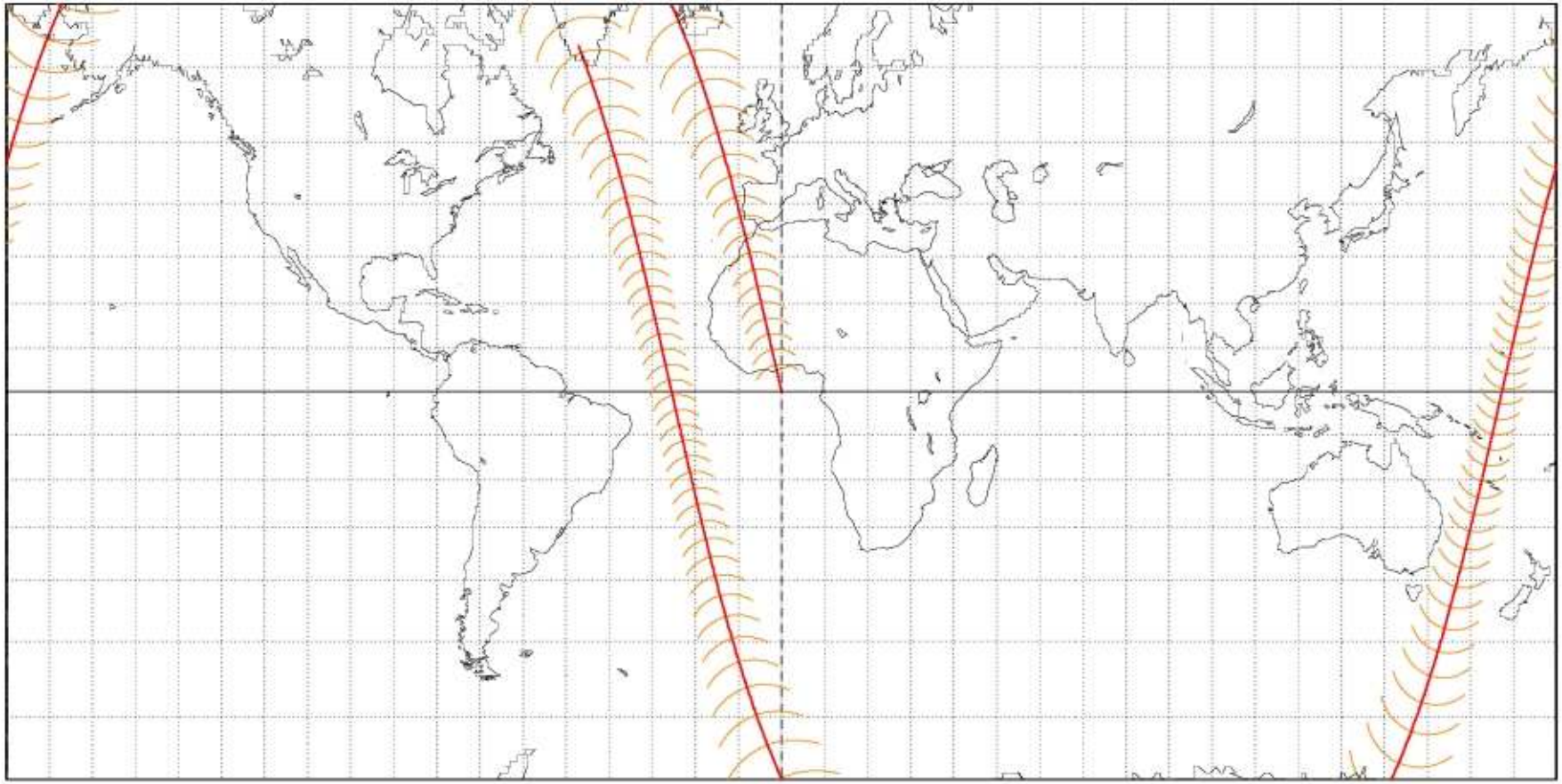
Altitude = 848.0 km a = 7226.136 km

Inclin./SUN-SYNCHRON.= 98.83 °

Period = 102.00 min * rev/day =14.12

Equat. orbital shift = 2838.8 km (25.5 °)

** Half-aperture: 51.0° - Radius/grnd 913 km [1.00 min]
** Effect. h-ap.: 38.6 ° => 709 km - Effect. swath: 1417 km



Projection: Mercator
Property: Conformal
⊕ T.:Cylindrical - Graticule: 10°

Project. centre: 0.0 ° ; 0.0 °
Aspect: Direct
{4.2}[+0.0/ +0.0/ +0.0] [-] EGM96

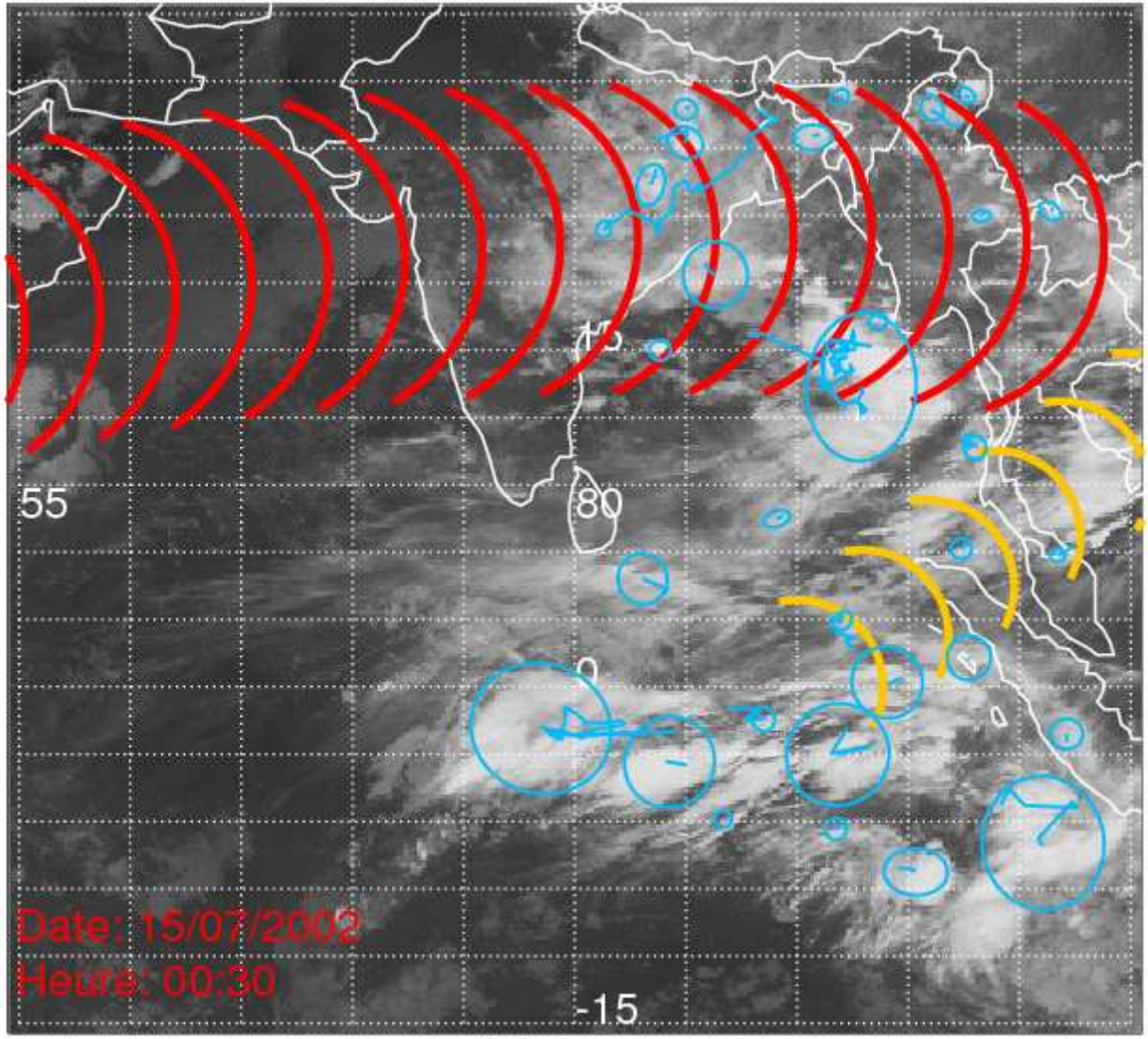
Asc. node: 0.00 °
Max. attained latit. = 87.5 °

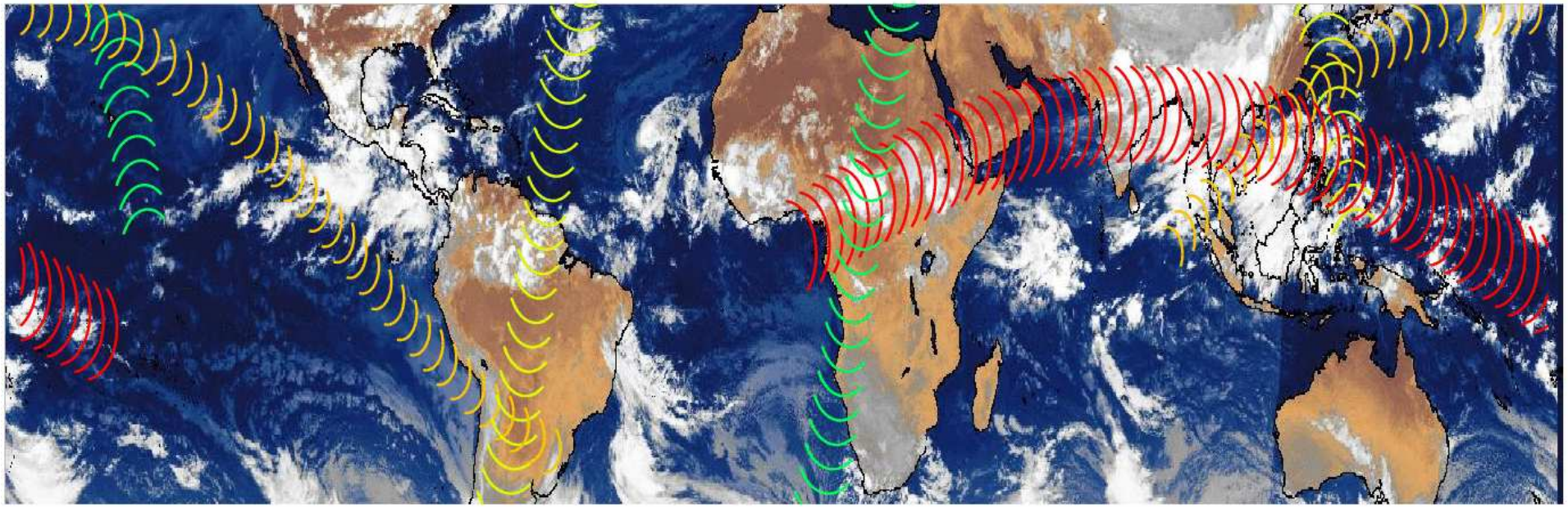
Ιξιων
MC ★ LMD
Ατλας

- MT + TRMM
- + 2 SSO (polar) satellites

Megha–Tropiques
TRMM
DMSP1
DMSP2

Image animation:
Thomas Fiolleau





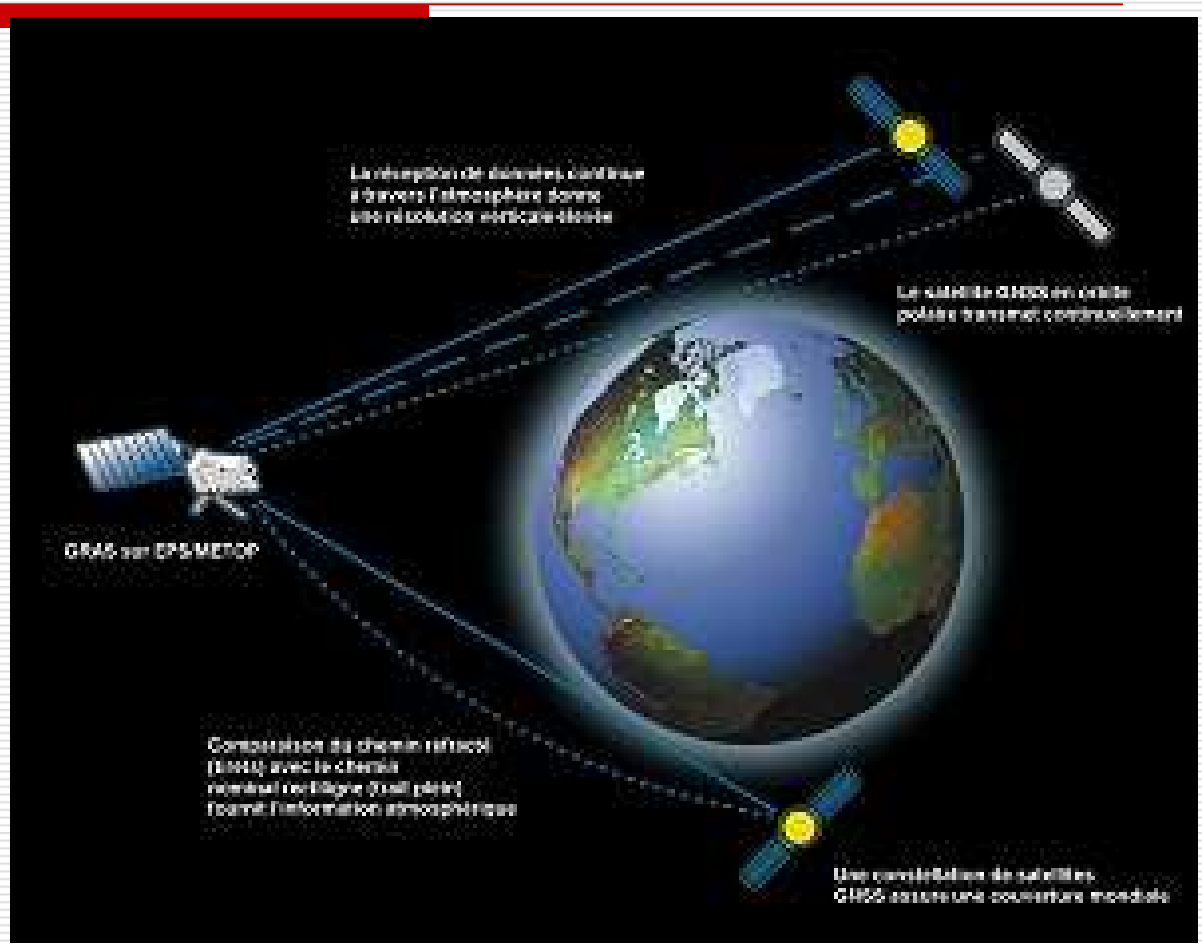
135°W	75°W	0°	63°E	140°E
GOES-10	GOES-12	METEOSAT-7	METEOSAT-5	MTSAT
(NOAA)	(NOAA)	(EUMETSAT)	(EUMATSAT)	(Japan Met. Ag.)

ROSA

Radio Occultation Sensor for Atmosphere

GRAS

(GNSS Receiver for Atmospheric Sounding)



Megha-Tropiques

0 km <-> 120 km - Radio Occultation avec NAVSTAR/GPS

>>> Durée représentée : 1440.0 min = 1.00 jour

Nombre total d'occultations : 24

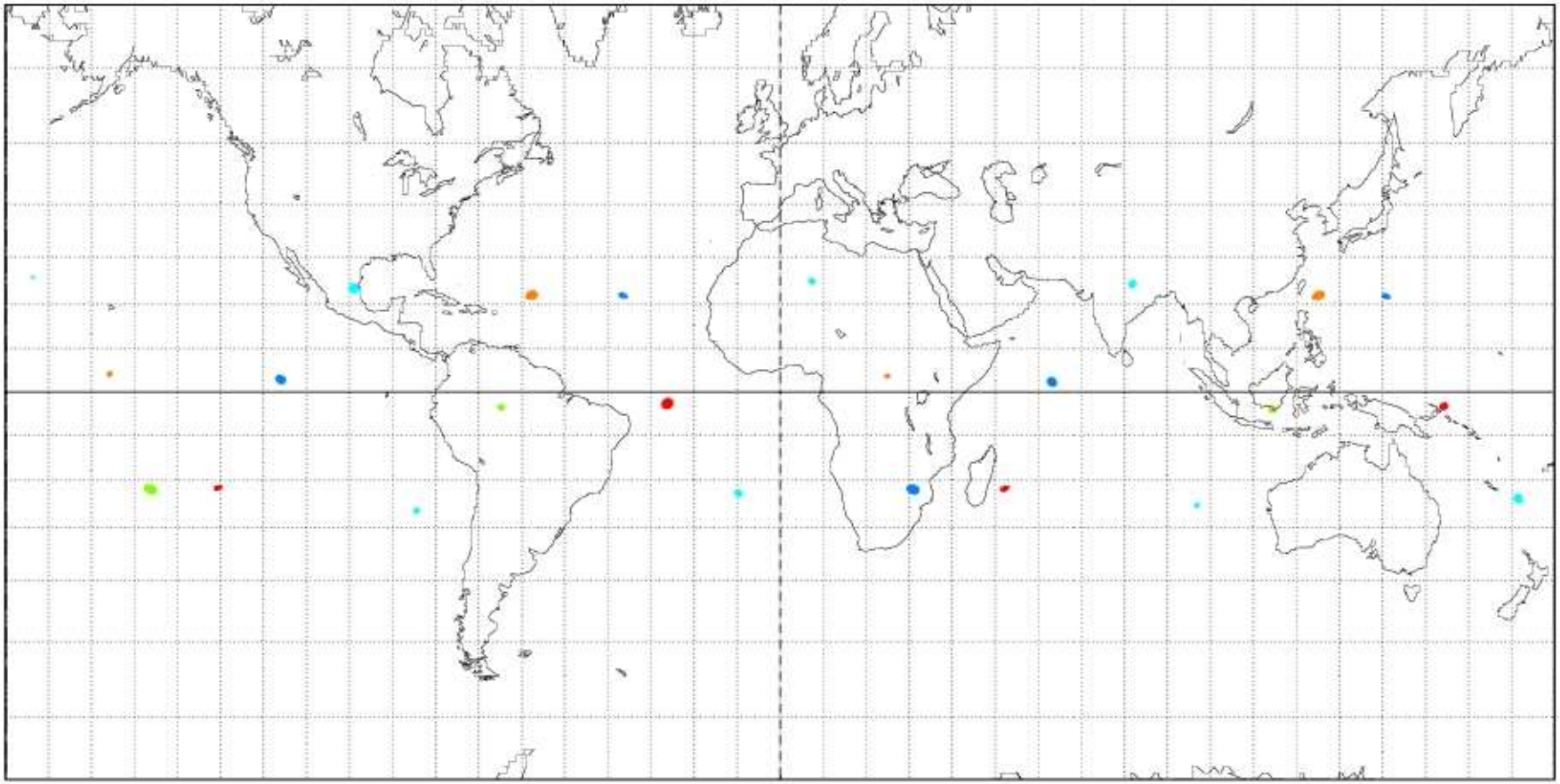
Altitude = 865.5 km a = 7243.678 km

Inclinaison = 20.00 °

Période = 101.93 min * Révol./j.=14.13

Décalage à l'équateur = 2892.0 km (26.0 °)

TSM (local) 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 heures



Projection : Mercator

Propriété : Conforme

⊕ T.:Cylindrique - Grille : 10°

Centre Project.: 0.0 ° ; 0.0 °

Aspect : Direct

{4.2}[+0.0/ +0.0/ +0.0] [-] GEM-T2

Noeud asc. : 0.00 °

Inclin. app. = 21.52 °

Ιξιων

MC ★ LMD

Ατλας

Megha-Tropiques

0 km <-> 250 km - Occultation Radio avec NAVSTAR/GPS

>>> Durée représentée : 14.00 jours

Nombre total d'occultations : 339

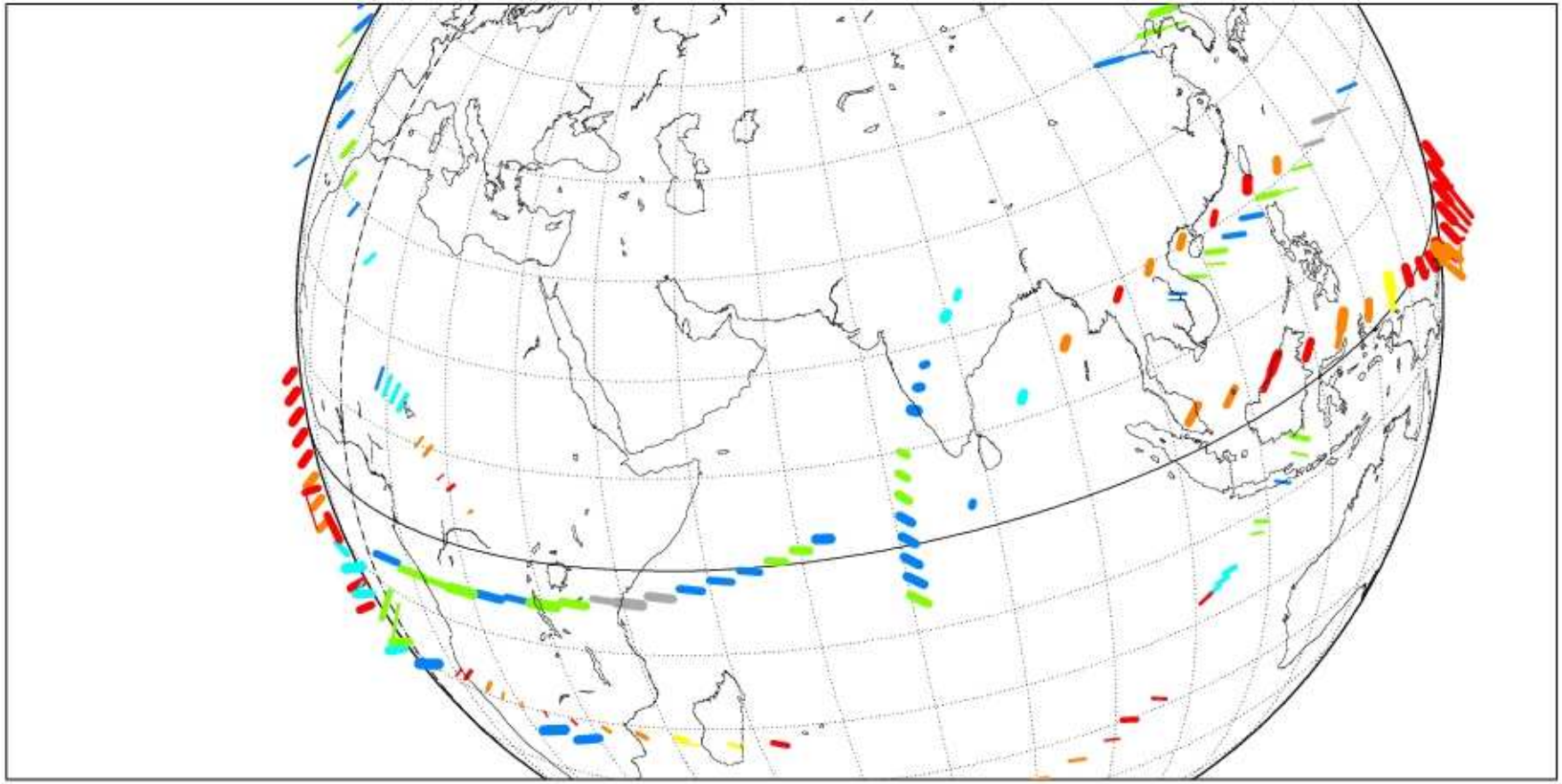
Altitude = 865.5 km a = 7243.678 km

Inclinaison = 20.00 °

Période = 101.93 min * Révol./j.=14.13

Décalage à l'équateur = 2892.0 km (26.0 °)

TSM (local) 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 heures



Projection : Orthographique

Propriété : (sans)

⊕ T.:Azimutal - Grille : 10°

CP: 25.0 ° N; 72.0 °E /CZ: 18.0 ° N; 61.0 ° E

Aspect : Oblique

{5.3} [-90.0/ +65.0/ +18.0] [+12] GEM-T2

Noeud asc. : 0.00 °

Ιξιων

MC ★ LMD

Ατλας

Megha-Tropiques

0 km <-> 250 km - Occultation Radio avec NAVSTAR/GPS

>>> Durée représentée : 21.00 jours

Nombre total d'occultations : 508

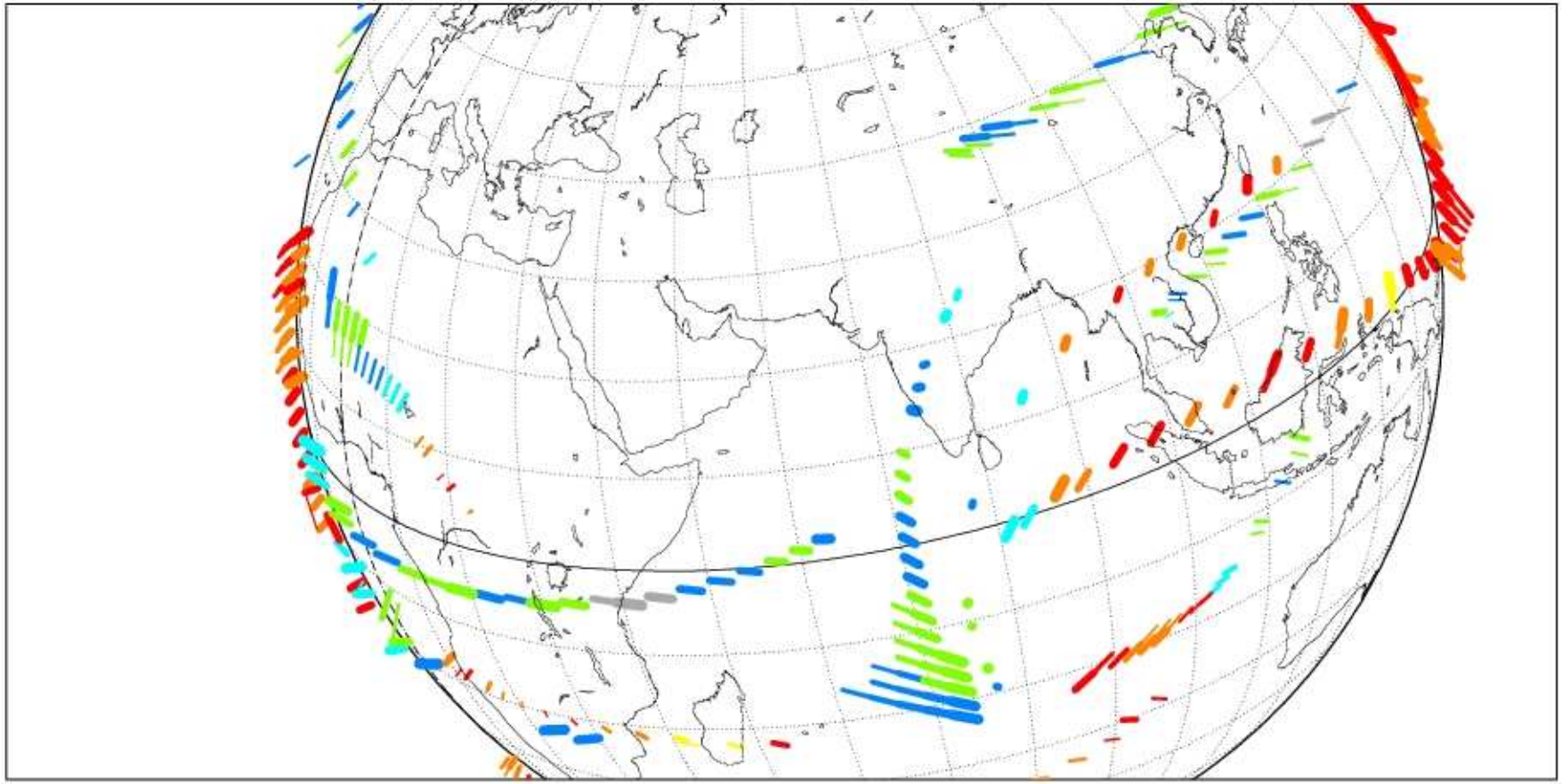
Altitude = 865.5 km a = 7243.678 km

Inclinaison = 20.00 °

Période = 101.93 min * Révol./j.=14.13

Décalage à l'équateur = 2892.0 km (26.0 °)

TSM (local) 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 heures



Projection : Orthographique CP: 25.0 ° N; 72.0 °E /CZ: 18.0 ° N; 61.0 ° E Noeud asc. : 0.00 °

Propriété : (sans) Aspect : Oblique

⊕ T.:Azimutal - Grille : 10° {5.3} [-90.0/ +65.0/ +18.0] [+12] GEM-T2

Ιξιων
MC ★ LMD
Ατλας

IXION Software

- http://climserv.ipsl.polytechnique.fr/ixion

IXION - Mozilla Firefox

er Edition Affichage Aller à Marque-pages Outils Aide

http://climserv.ipsl.polytechnique.fr/ixion-dev/index.php

OK

roducts Shop Support Training Red Hat, Inc. Red Hat Network

IXION

IXION : Orbitographie et échantillonnage

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Corps Attractif

Terre

Infos Annuler

Satellite

Megha-Tropiques

Norad Orbite Phasage Annexes

Annuler

Type de Sortie

ORBITOGRAPHIE : Trace simple
(avec fauchées éventuelles)

Annuler

Représentation de l"orbite

Annuler Modifier les choix

Fauchées

Annuler Modifier les choix

Megha-Tropiques

Trace de l'orbite elliptique

Phasage = [14; -1; 7] 97

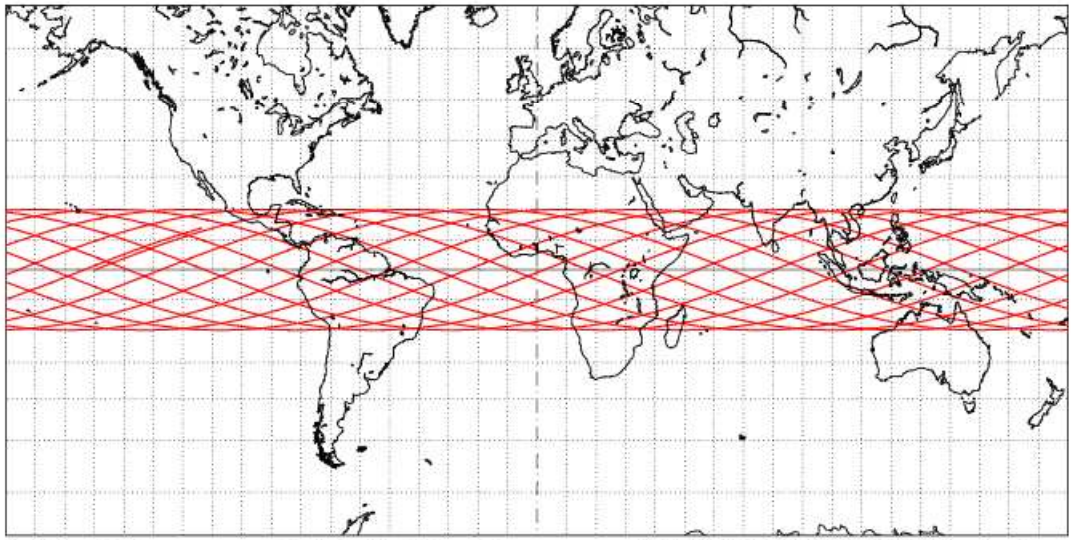
2009 06 01 03:00:00 TUC >>> 1440.0 min = 1.00 jour

Altit. équival. = 865.5 km a = 7243.683 km

Inclinaison = 20.00 e = 0.000352

Période = 101.93 min * Révol./j.=14.13

h_a = 868 km ; h_p = 863 km ; arg. périgée : +90.00



Projection : Mercator
Propriété : Conforme
T.:Cylindrique - Grille : 10

Centre Project.: 0.0 ; 0.0
Aspect : Direct
[S.3] [+90.0/ +0.0/ -90.0] [+0] EGM96

[NORAD] 2009 06 01 03:00:00 TUC / R: 1 Ιξιων
Noeud asc. : -149.73 [17:01 TSM] MC * LMD
Apogée : 126.66 Ατλασ

> Imprimer l'image <

JOUR Temps TU	Longitude	Lat.gc_T.	Lat.gd_T.	Lat.gd_N.	Altit. (km)	S Zen	JN	S Azi	TSM
2009 06 01 03:00:00	-149.732	0.000	0.000	0.000	865.546	76.9	**	67.6	17:01
2009 06 01 03:01:00	-146.668	1.207	1.215	1.214	865.398	79.6	**	68.0	17:14
2009 06 01 03:02:00	-143.600	2.411	2.427	2.425	865.272	82.2	**	68.3	17:28
2009 06 01 03:03:00	-140.527	3.606	3.630	3.627	865.163	84.8	**	68.4	17:41
2009 06 01 03:04:00	-137.444	4.789	4.821	4.817	865.074	87.5	**	68.3	17:54
2009 06 01 03:05:00	-134.350	5.956	5.996	5.991	865.005	90.1	..	68.0	18:08
2009 06 01 03:06:00	-131.242	7.103	7.150	7.144	864.954	92.8	..	67.6	18:21
2009 06 01 03:07:00	-128.117	8.225	8.280	8.273	864.922	95.4	..	67.0	18:35
2009 06 01 03:08:00	-124.973	9.319	9.381	9.373	864.904	98.1	..	66.2	18:48
2009 06 01 03:09:00	-121.807	10.381	10.449	10.441	864.902	100.7	..	65.2	19:02
2009 06 01 03:10:00	-118.619	11.406	11.481	11.472	864.914	103.3	..	64.1	19:16
2009 06 01 03:11:00	-115.406	12.391	12.472	12.462	864.937	105.9	..	62.7	19:29
2009 06 01 03:12:00	-112.168	13.332	13.418	13.408	864.972	108.5	..	61.2	19:43
2009 06 01 03:13:00	-108.902	14.224	14.316	14.305	865.013	111.0	..	59.5	19:57
2009 06 01 03:14:00	-105.610	15.065	15.162	15.150	865.061	113.5	..	57.5	20:12
2009 06 01 03:15:00	-102.290	15.850	15.952	15.939	865.115	115.9	..	55.4	20:26
2009 06 01 03:16:00	-98.943	16.576	16.682	16.669	865.170	118.3	..	53.1	20:40
2009 06 01 03:17:00	-95.570	17.240	17.349	17.336	865.226	120.6	..	50.5	20:55
2009 06 01 03:18:00	-92.172	17.839	17.951	17.938	865.279	122.9	..	47.7	21:09
2009 06 01 03:19:00	-88.751	18.369	18.484	18.470	865.331	125.0	..	44.7	21:24
2009 06 01 03:20:00	-85.308	18.828	18.946	18.931	865.378	127.1	..	41.4	21:39
2009 06 01 03:21:00	-81.847	19.214	19.334	19.319	865.419	129.0	..	37.9	21:54
2009 06 01 03:22:00	-78.370	19.524	19.646	19.631	865.454	130.8	..	34.2	22:09
2009 06 01 03:23:00	-74.881	19.758	19.881	19.866	865.481	132.5	..	30.1	22:23
2009 06 01 03:24:00	-71.382	19.914	20.038	20.023	865.497	134.0	..	25.9	22:38
2009 06 01 03:25:00	-67.878	19.991	20.115	20.100	865.507	135.4	..	21.3	22:53
2009 06 01 03:26:00	-64.372	19.989	20.113	20.098	865.507	136.5	..	16.6	23:09
2009 06 01 03:27:00	-60.868	19.907	20.031	20.016	865.495	137.5	..	11.7	23:24
2009 06 01 03:28:00	-57.369	19.747	19.870	19.855	865.477	138.2	..	6.6	23:39
2009 06 01 03:29:00	-53.880	19.509	19.630	19.616	865.449	138.7	..	1.4	23:53
2009 06 01 03:30:00	-50.404	19.194	19.314	19.299	865.412	138.9	..	-3.9	00:08
2009 06 01 03:31:00	-46.944	18.804	18.921	18.907	865.370	138.9	..	-9.1	00:23
2009 06 01 03:32:00	-43.503	18.340	18.456	18.442	865.322	138.6	..	-14.3	00:38
2009 06 01 03:33:00	-40.083	17.806	17.919	17.905	865.270	138.1	..	-19.4	00:53
2009 06 01 03:34:00	-36.686	17.204	17.313	17.300	865.214	137.4	..	-24.3	01:07
2009 06 01 03:35:00	-33.315	16.537	16.642	16.629	865.156	136.4	..	-29.0	01:22
2009 06 01 03:36:00	-29.970	15.807	15.908	15.896	865.101	135.3	..	-33.4	01:36
2009 06 01 03:37:00	-26.651	15.019	15.115	15.104	865.048	133.9	..	-37.6	01:50
2009 06 01 03:38:00	-23.360	14.175	14.267	14.256	864.999	132.4	..	-41.5	02:05
2009 06 01 03:39:00	-20.096	13.280	13.366	13.355	864.956	130.7	..	-45.0	02:19
2009 06 01 03:40:00	-16.859	12.336	12.417	12.407	864.924	128.9	..	-48.3	02:33
2009 06 01 03:41:00	-13.648	11.349	11.423	11.414	864.900	126.9	..	-51.3	02:46
2009 06 01 03:42:00	-10.461	10.321	10.389	10.381	864.887	124.9	..	-54.0	03:00
2009 06 01 03:43:00	-7.296	9.258	9.319	9.312	864.890	122.7	..	-56.5	03:14

Terra / CERES
Orbit - Ground track

Altitude = 699.6 km a = 7077.738 km

Inclination / SUN-SYNCHRON.= 98.21 °

Recurrence = [15; -7; 16] 233

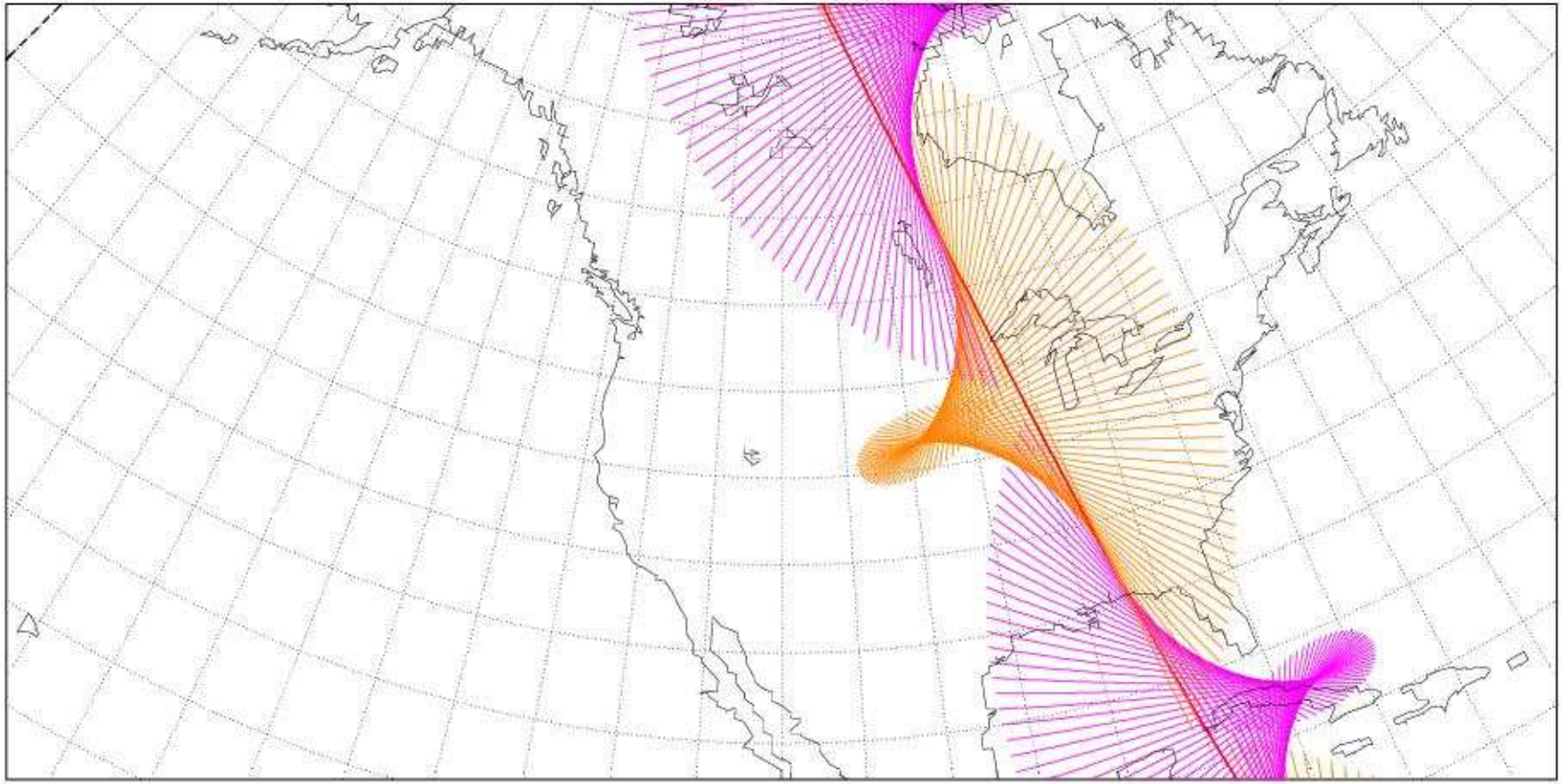
Period = 98.88 min * rev/day =14.56

>>>> Time span shown: 99.0 min = 0.07 day

Equat. orbital shift = 2751.9 km (24.7 °)

Alternated variable-yaw swath [+12.0 min]

** Half-swath: 55.0° => 1154 km [0.1 min]



Projection: Mercator Map centre: 45.0 ° N: 110.0 ° W Asc. node: -80.00 ° [22:30 LMT] Ξιων

Property: Conformal Aspect: Oblique > zoom : 4.00 Max. attained latit. = 90.0 ° MC ★ LMD

T.:Cylindrical ⊕ Graticule: 5° [+90.0 / +45.0 / +20.0] Gr.Mod.: GEM-T2 Ατλας

METOP-A

0 km <-> 1600 km - Superposition (pt interm.) avec AQUA
[+/- 15.0 min]

Phasage = [14; +6; 29] 412

2008 03 07 00:00:00 TUC >>> 2880.0 min = 2.00 jours

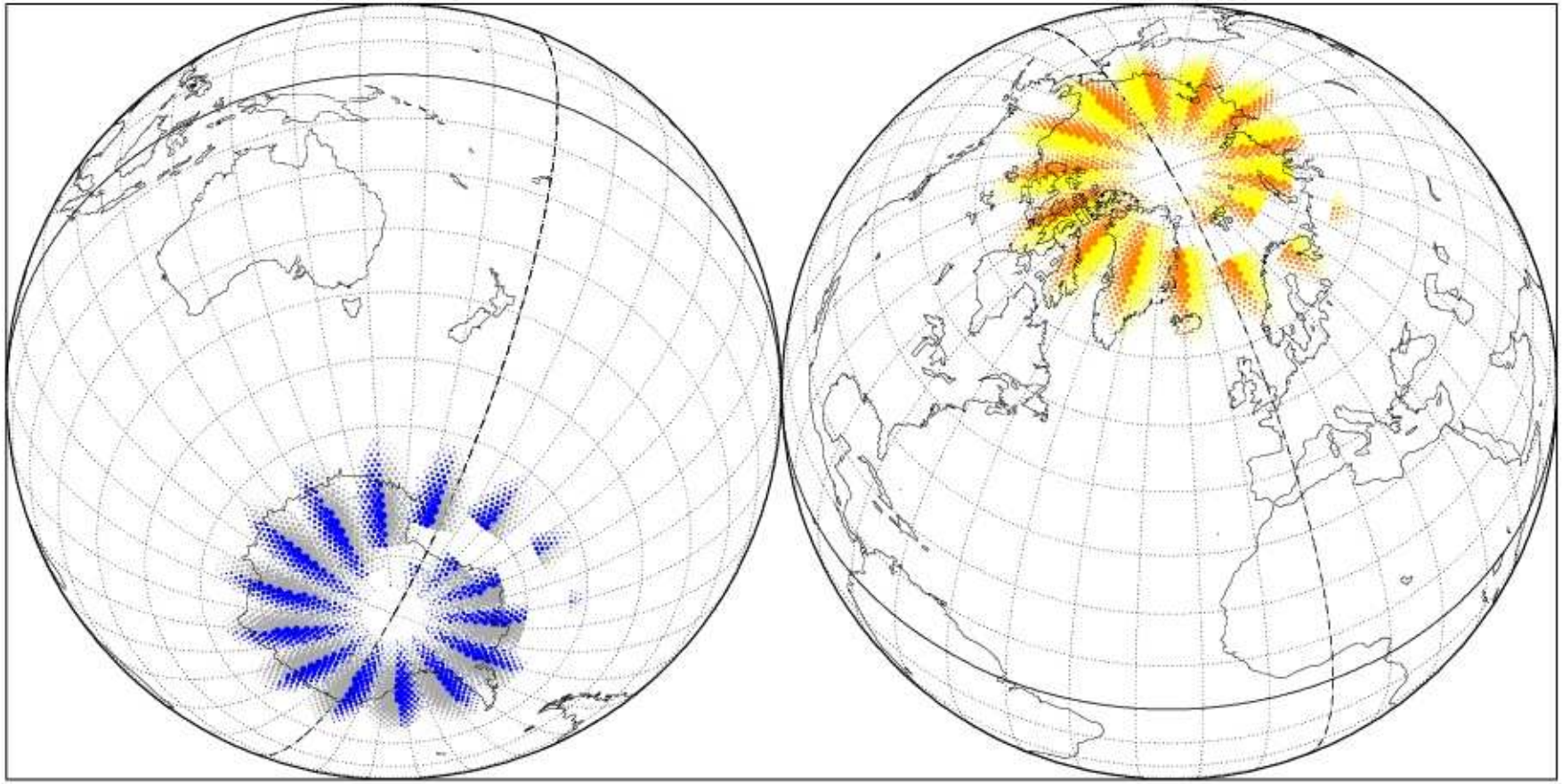
Altitude = 817.4 km a = 7195.547 km

Incl. HELIOS. = 98.67 ° e = 0.000106

Période = 101.36 min * Révol./j.=14.21

*** [+/- 800 km] METOP-A *** [+/- 800 km] AQUA

TSM (local) 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 heures



Projection : Orthographique
Propriété : (sans)
⊕ T.:Azimutal - Grille : 10°

Centre Pr.(dr.): 55.0 ° N ; 25.0 ° W
Aspect : Oblique
{4.2} [-90.0/ +35.0/+115.0] [-] GEM-T2

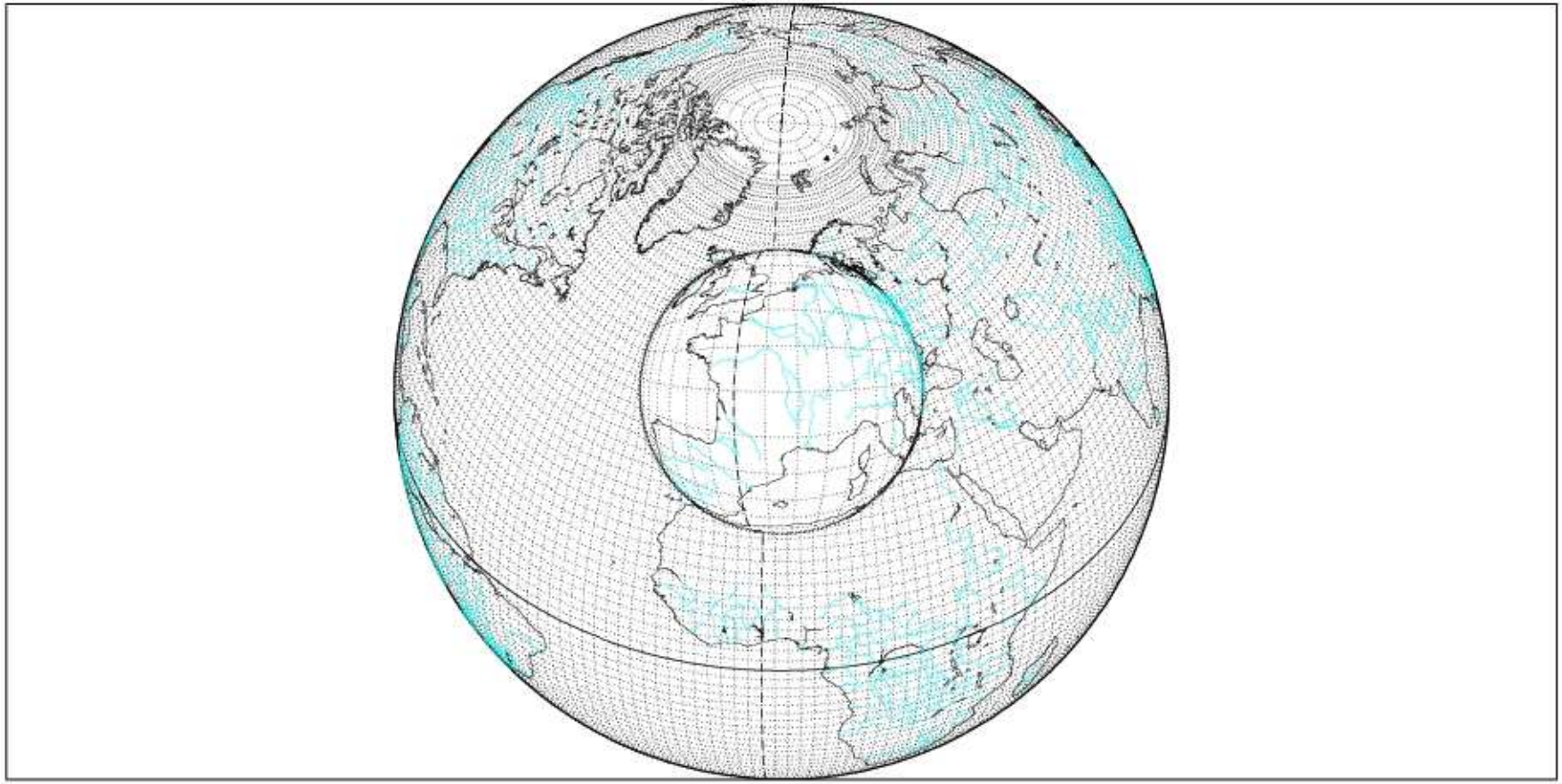
Noeud asc. : -97.96 ° [21:30 TSM]
[NORAD] Révolution : 7152
[NORAD] 2008 03 06 04:01:29 TUC

Ιξιων
MC ★ LMD
Ατλας

Projection : Orthogr. / FishEye
Propriété : (sans)
⊕ T.:Azimutal - Grille : 2°

Centre Project.: 46.0 ° N ; 3.0 °E
Aspect : Oblique
{5.3} [-90.0/ +44.0/ +87.0] [-] GEM-T2

Ιξιων
MC ★ LMD
Ατλας



- ***View from the sky***

- If you are aboard Megha-Tropiques

Megha-Tropiques
Ground track (with LMT)

MT over Bangalore

>>>> Time span shown: 2880.0 min = 2.00 days

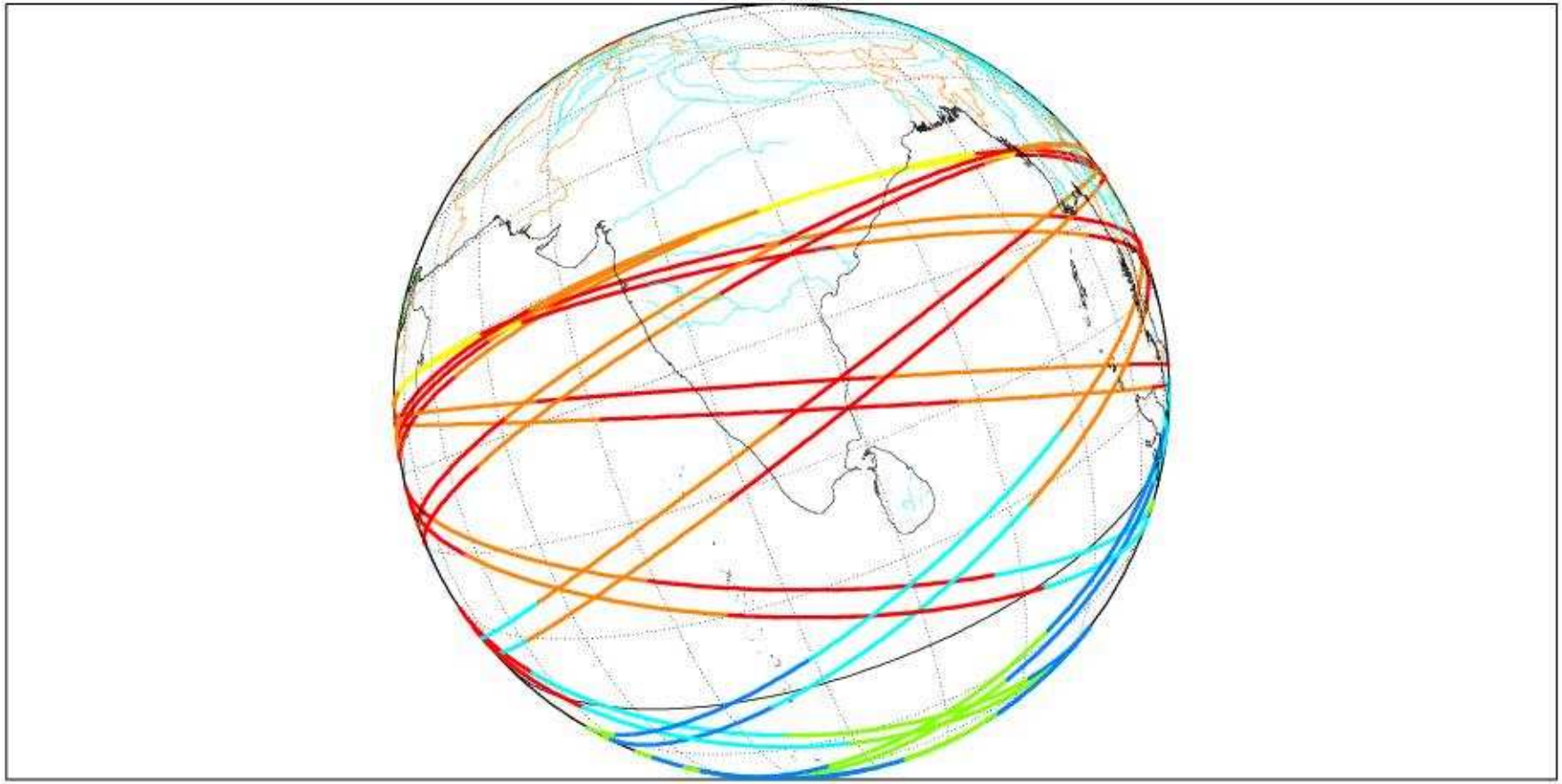
Altitude = 865.5 km a = 7243.678 km

Inclination = 20.00 °

Period = 101.93 min * rev/day =14.13

Equat. orbital shift = 2892.0 km (26.0 °)

LMT (local) 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 hours

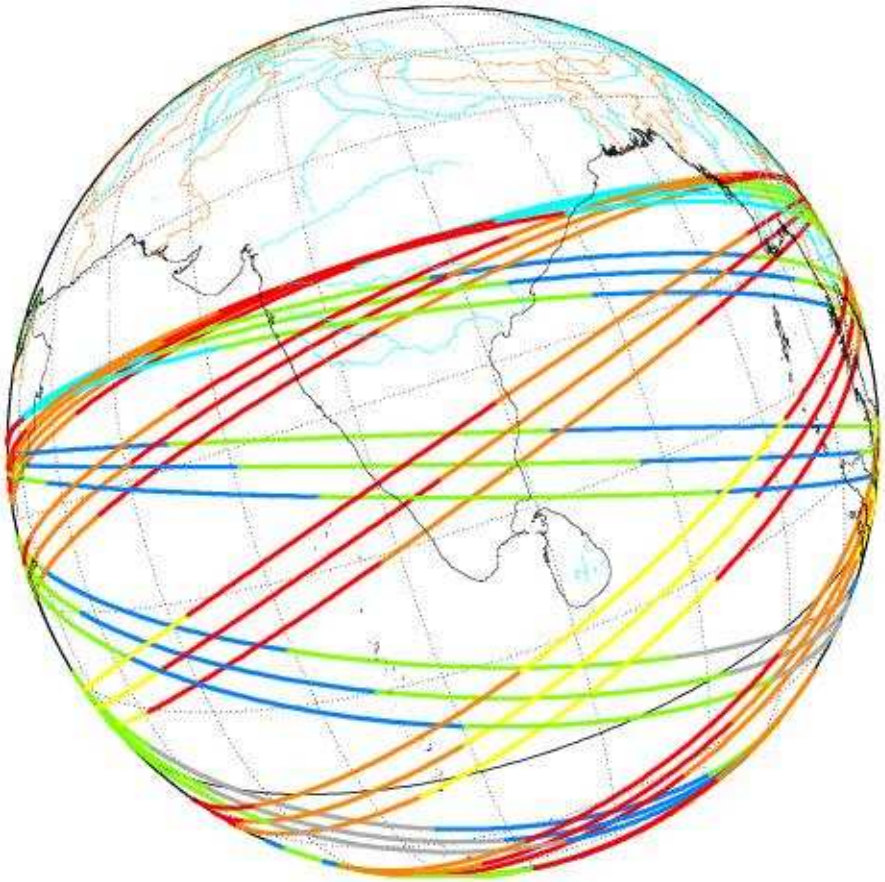


Projection: Pt View Sat h=0.14 R Map centre: 13.0 ° N; 77.6 °E Asc. node: 0.00 ° [06:00 LMT]

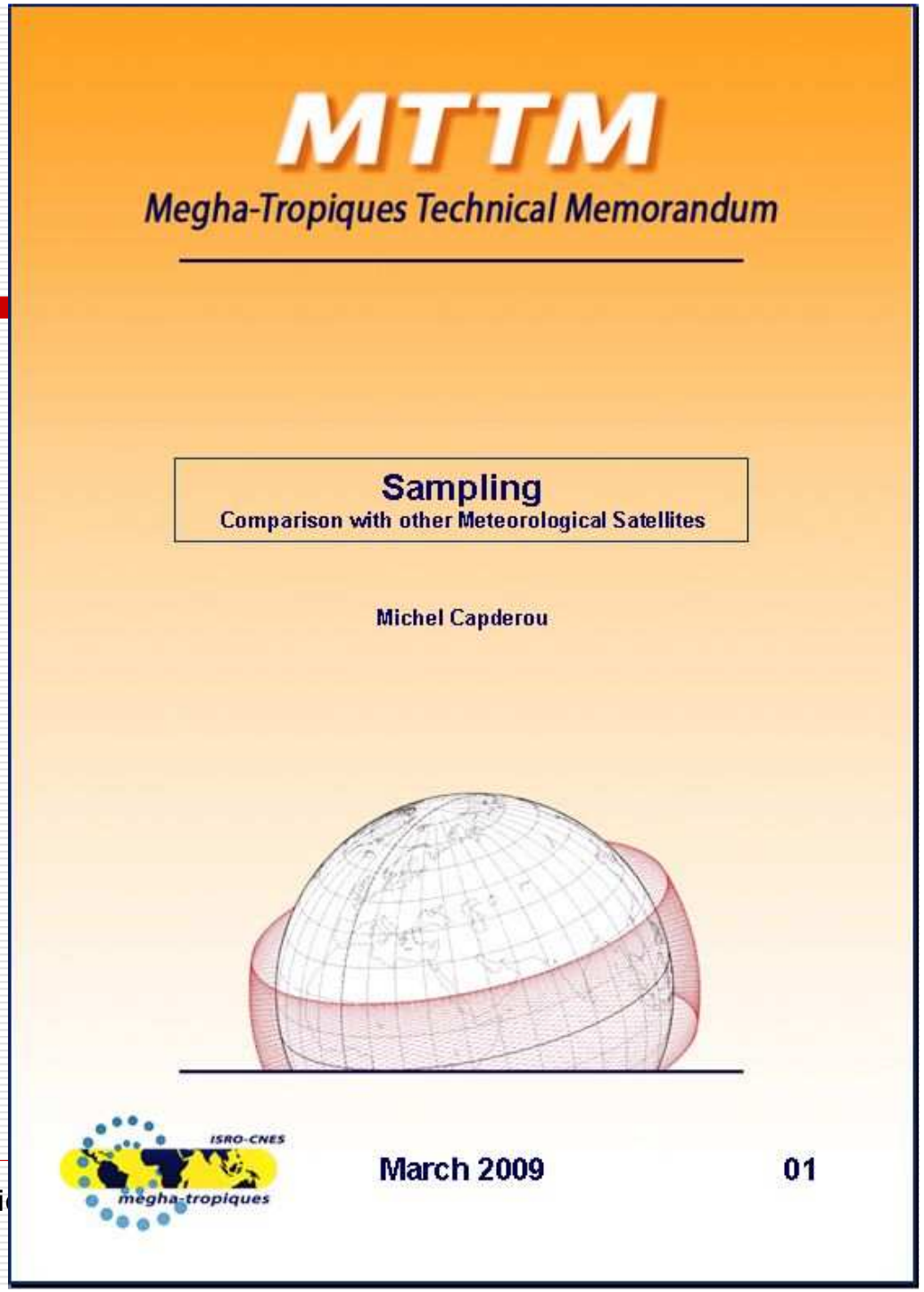
Property: none Aspect: Oblique

⊕ T.:Azimuthal - Graticule: 5° {6.4} [-90.0/ +77.0/ +12.4] [+20] GEM-T2

Ξιων
MC ★ LMD
Ατλας



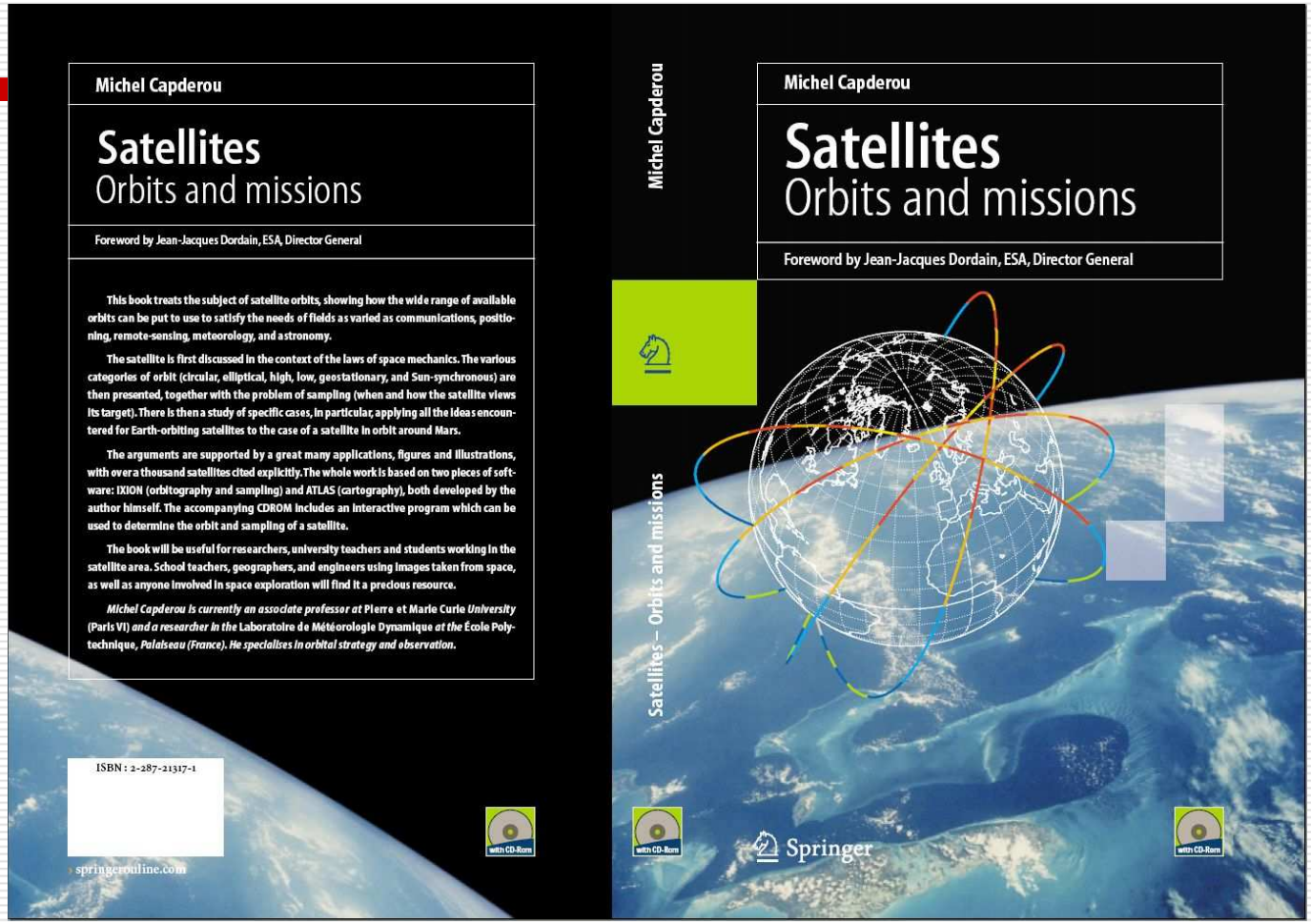
- Megha-
- Tropiques
- Technical
- Memorendum



- Maps
- Graphs
- Diagrams

from
IXION software

© MC / LMD



Michel Capderou

Satellites
Orbits and missions

Foreword by Jean-Jacques Dordain, ESA, Director General

This book treats the subject of satellite orbits, showing how the wide range of available orbits can be put to use to satisfy the needs of fields as varied as communications, positioning, remote-sensing, meteorology, and astronomy.

The satellite is first discussed in the context of the laws of space mechanics. The various categories of orbit (circular, elliptical, high, low, geostationary, and Sun-synchronous) are then presented, together with the problem of sampling (when and how the satellite views its target). There is then a study of specific cases, in particular, applying all the ideas encountered for Earth-orbiting satellites to the case of a satellite in orbit around Mars.

The arguments are supported by a great many applications, figures and illustrations, with over a thousand satellites cited explicitly. The whole work is based on two pieces of software: IXION (orbitography and sampling) and ATLAS (cartography), both developed by the author himself. The accompanying CDROM includes an interactive program which can be used to determine the orbit and sampling of a satellite.

The book will be useful for researchers, university teachers and students working in the satellite area. School teachers, geographers, and engineers using images taken from space, as well as anyone involved in space exploration will find it a precious resource.

Michel Capderou is currently an associate professor at Pierre et Marie Curie *University* (Paris VI) *and a researcher in the* Laboratoire de Météorologie Dynamique *at the* École Polytechnique, *Palaiseau (France). He specialises in orbital strategy and observation.*

ISBN : 2-287-21317-1

springeronline.com

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