

Envisat Mission Status

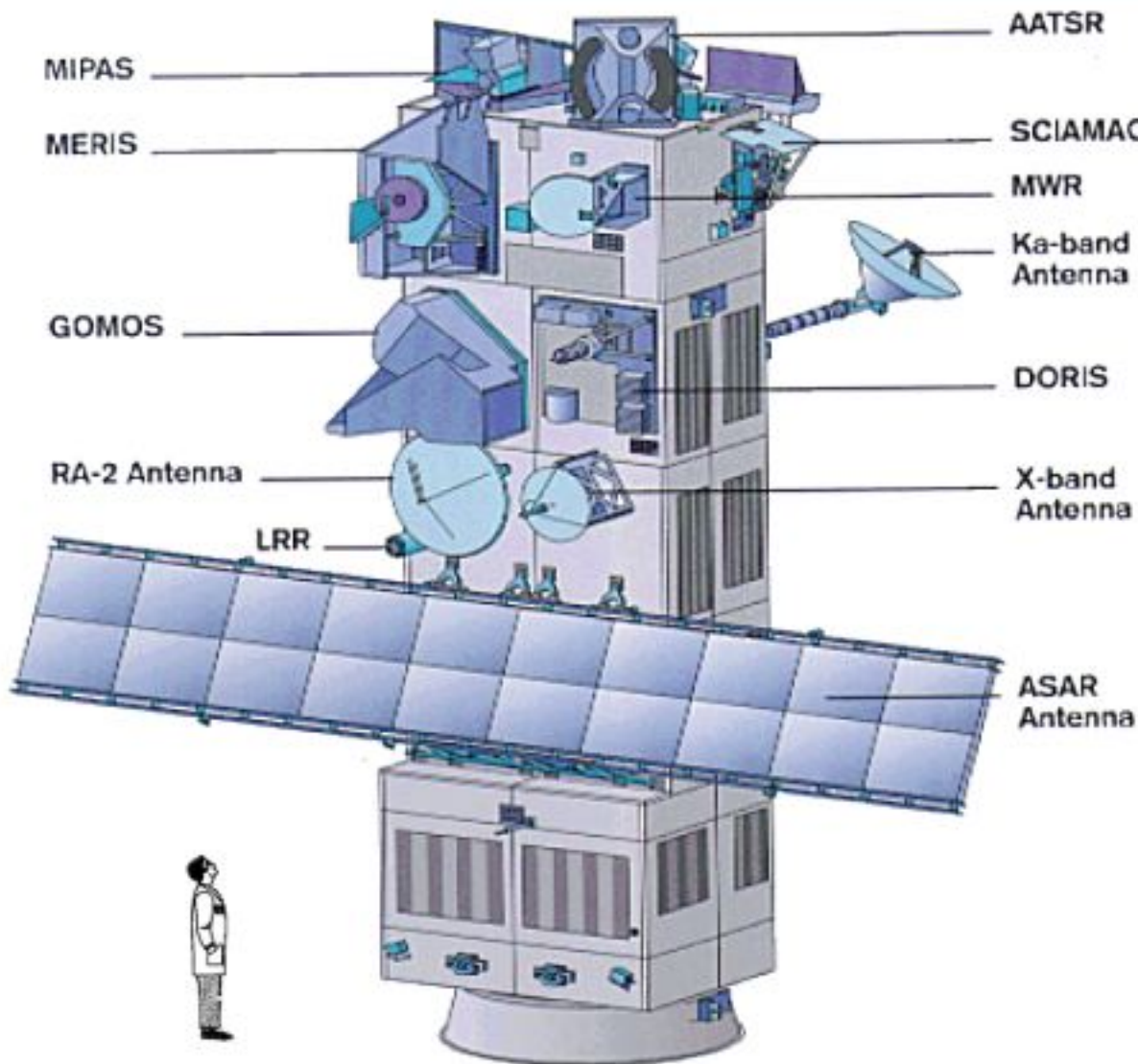
Pierre FÉMÉNIAS

European Space Agency
ESA/ESRIN

Earth Observation GS Department

Pierre.Femenias@esa.int

ENVISAT: the most powerful tool for monitoring the state of our planet



• Dimensions

Launch configuration:
length 10.5 m
envelope diameter 4.6 m
In-Orbit configuration:
26m x 10m x 5m

• Mass

Total satellite **8140 Kg**
Payload 2050 Kg

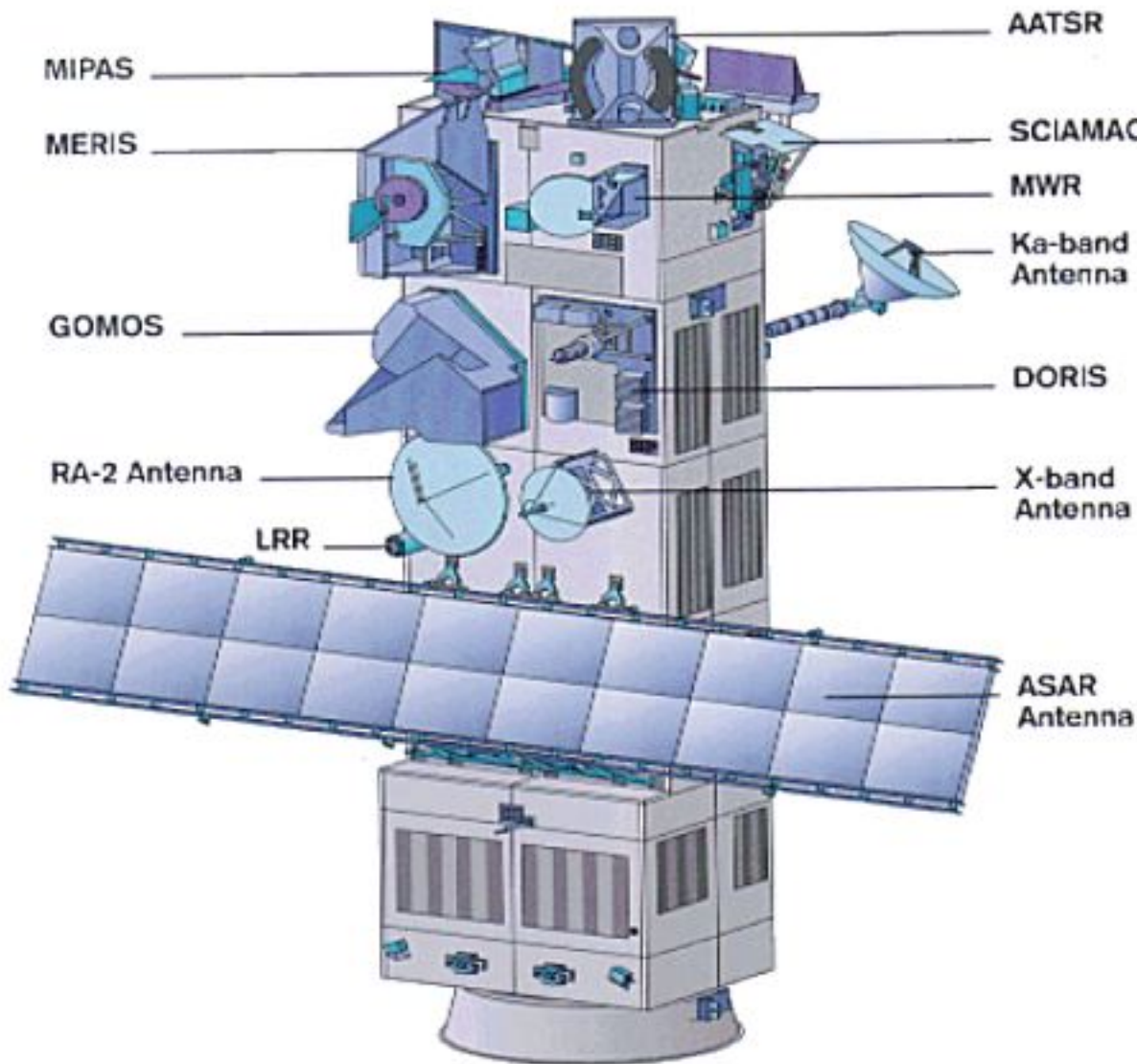
• Power

Solar array power:
6.5 kW (EOL)
Average power demand:

	Sun (watts)	Eclipse (watts)
Payload	1700	1750
Satellite	3275	2870

• Orbit

800 km as ERS, sun synchronous
10:00, i.e. 30 minutes before ERS-2



ESA Developed Instruments

- ASAR [Advanced Synthetic Aperture Radar]
- MERIS [Medium Resolution Imaging Spectrometer]
- GOMOS [Global Ozone Monitoring by Occultation of Stars]
- MIPAS [Michelson Interferometric Passive Atmospheric Sounder]
- RA-2 [Radar Altimeter 2]
- MWR [Microwave Radiometer]
- LRR [Laser Retro Reflector]

Announcement of Opportunity Instruments

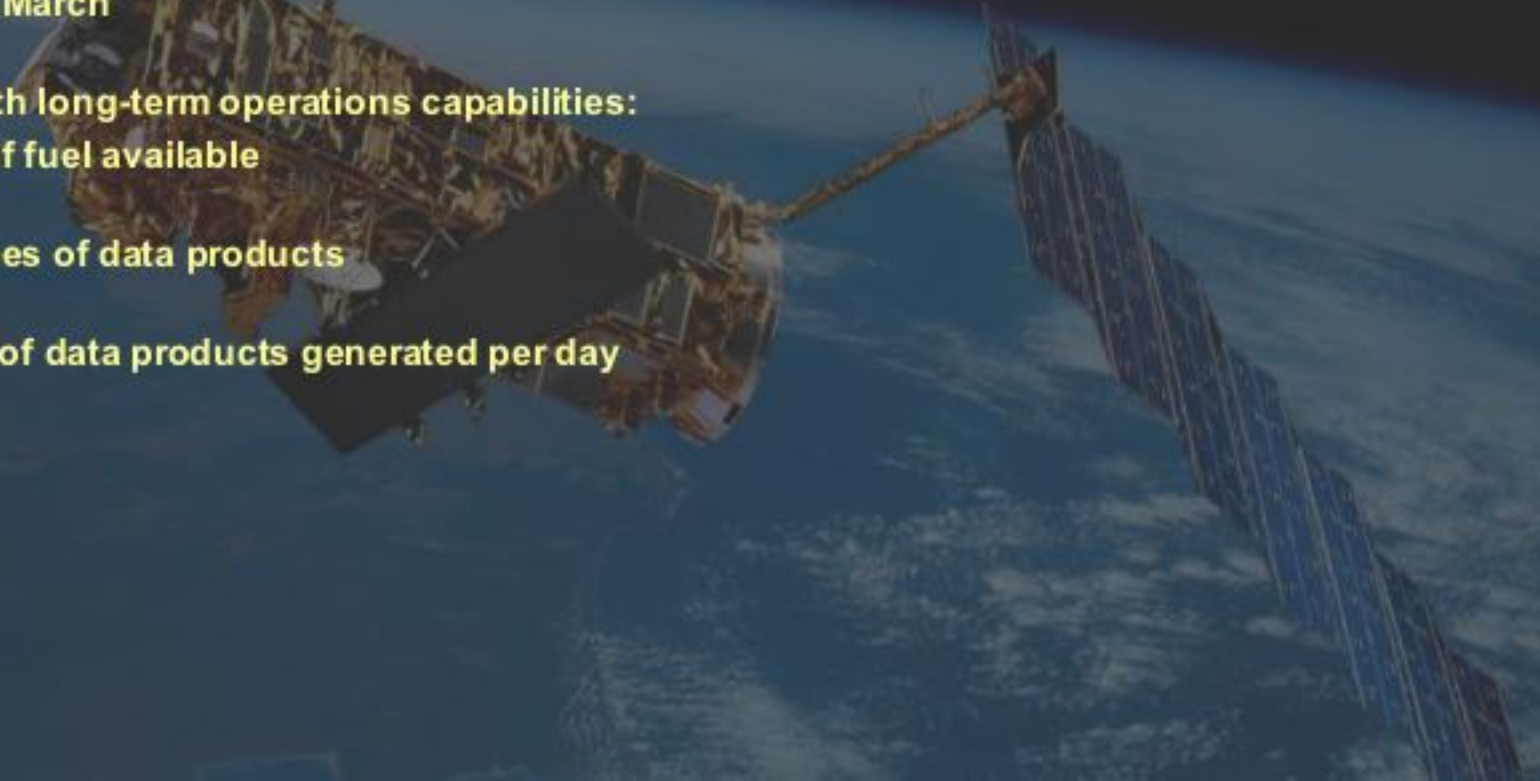
- AATSR [Advanced Along Track Scanning Radiometer]
- SCIAMACHY [Scanning Imaging Absorption Spectrometer for Atmospheric Cartography]
- DORIS [Doppler Orbitography and Radio-positioning Integrated by Satellite]

ENVISAT Mission

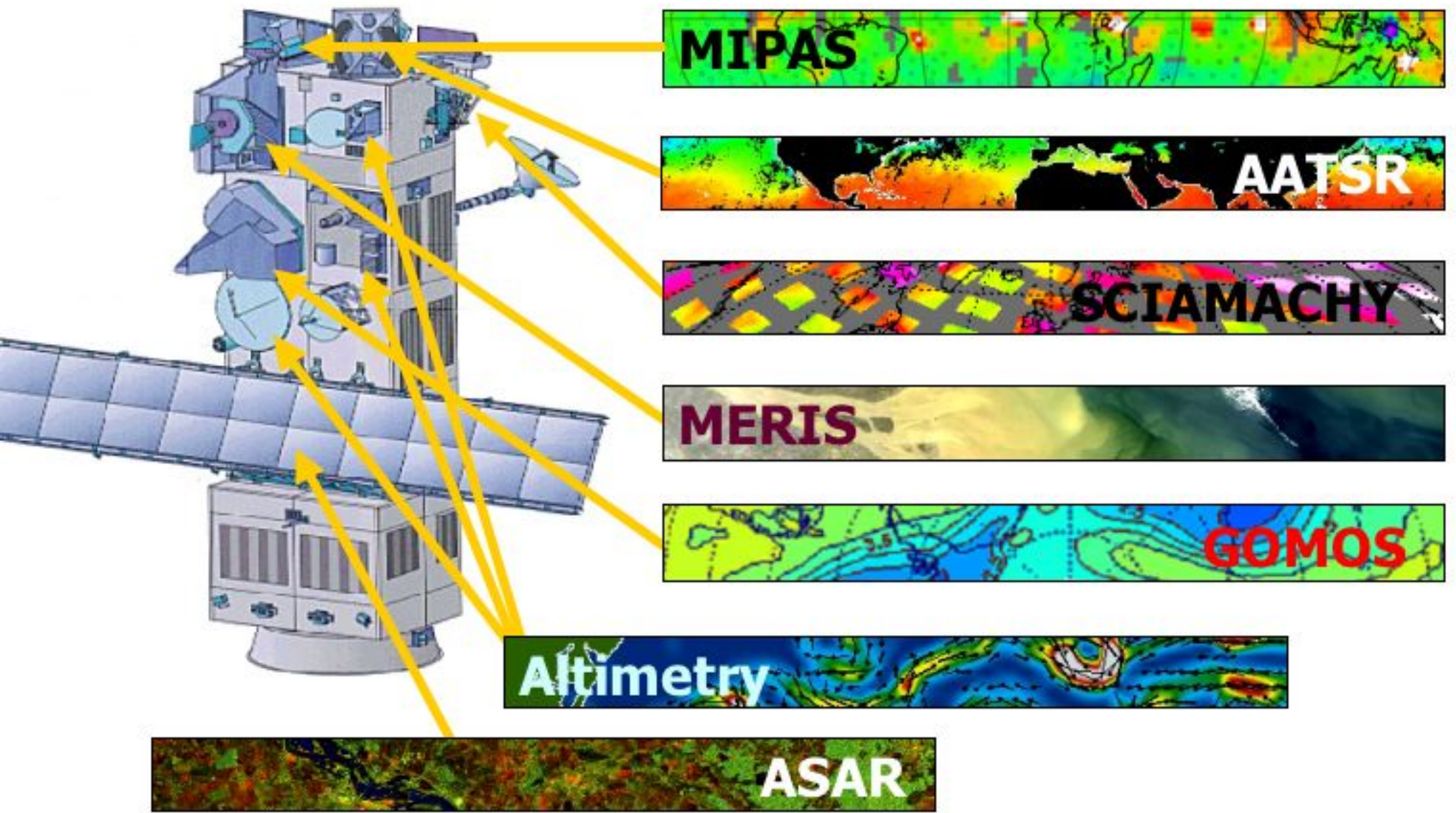
Some numbers



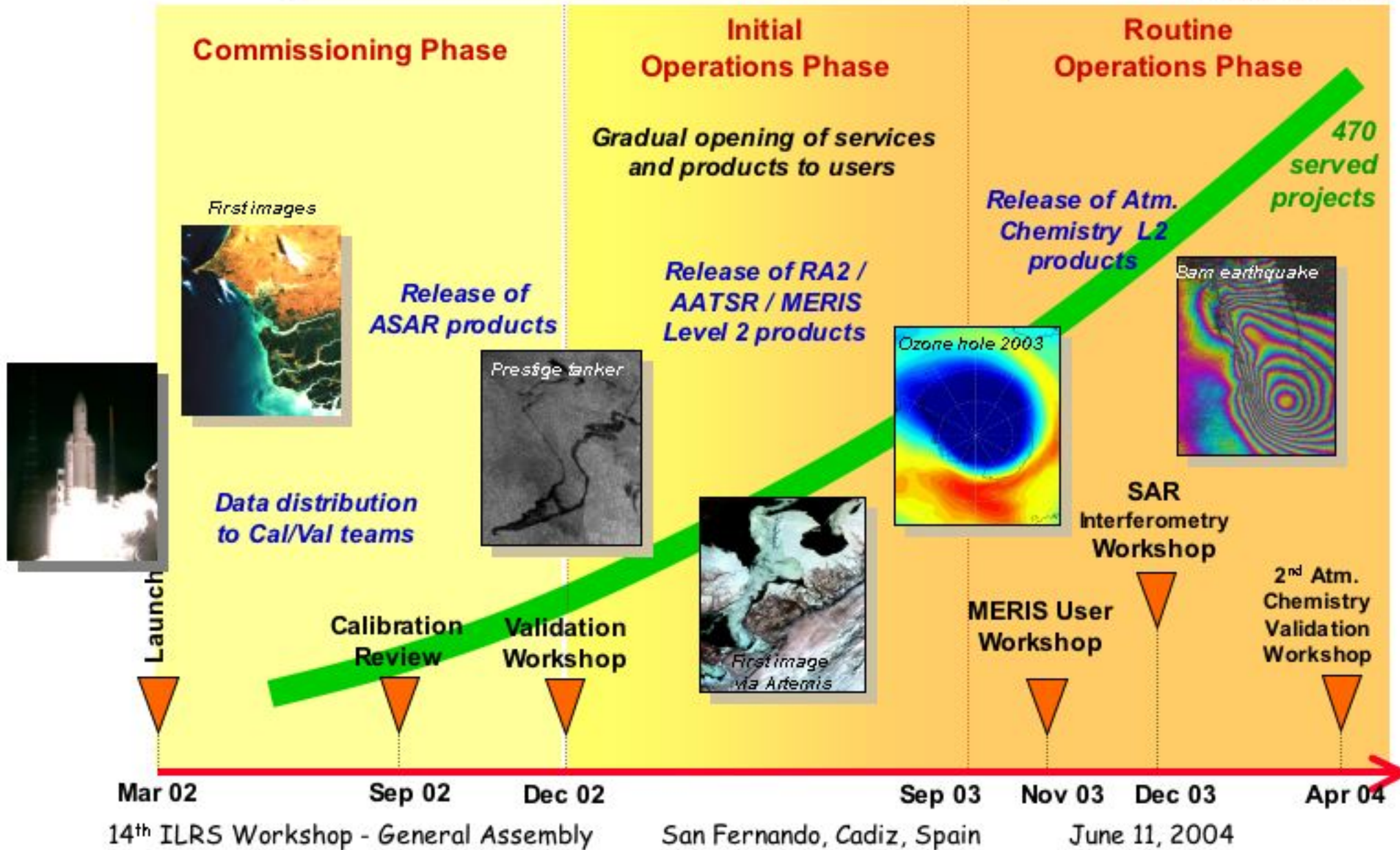
- **Largest European satellite & largest worldwide EO satellite:**
 - unique combination of 10 instruments ,
 - all instruments working nominally,
 - however recent anomalies with MIPAS instrument led to the suspension of the instrument operations on 26 March
- **Satellite OK with long-term operations capabilities:**
 - 75 % of fuel available
- **77 different types of data products**
- **140 Gigabytes of data products generated per day**



ENVISAT: the most powerful tool for monitoring the state of our planet

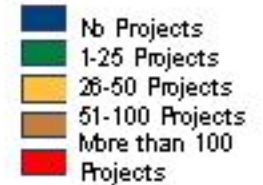


ENVISAT mission phases since launch



Science

Worldwide scientific community
(more than 3000 scientists)



Public sector

Some examples:

Treaty conventions



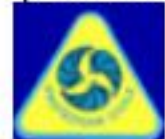
Weather forecast



Sea ice services



Civil protections



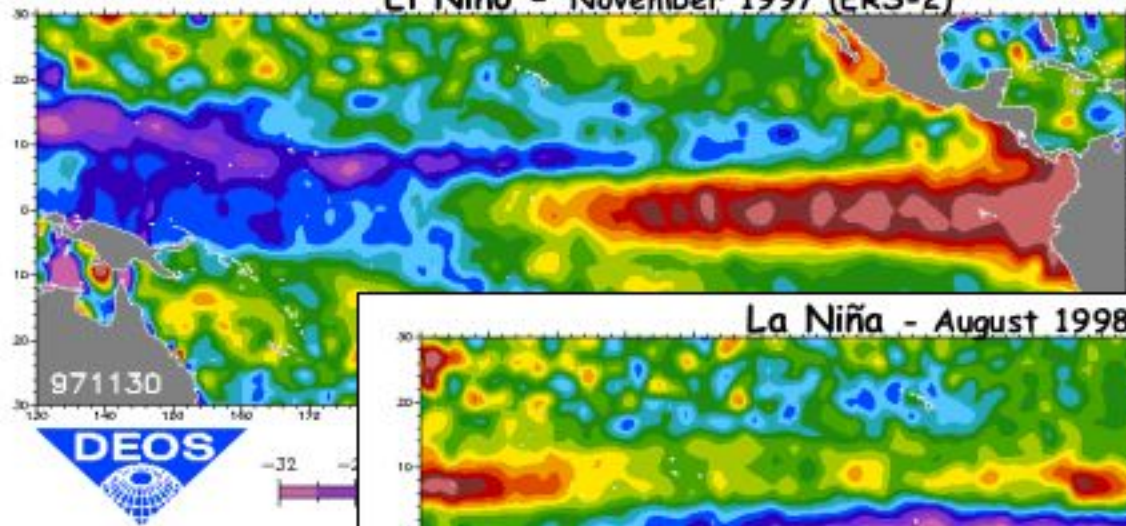
Commercial

2 Distributing Entities:



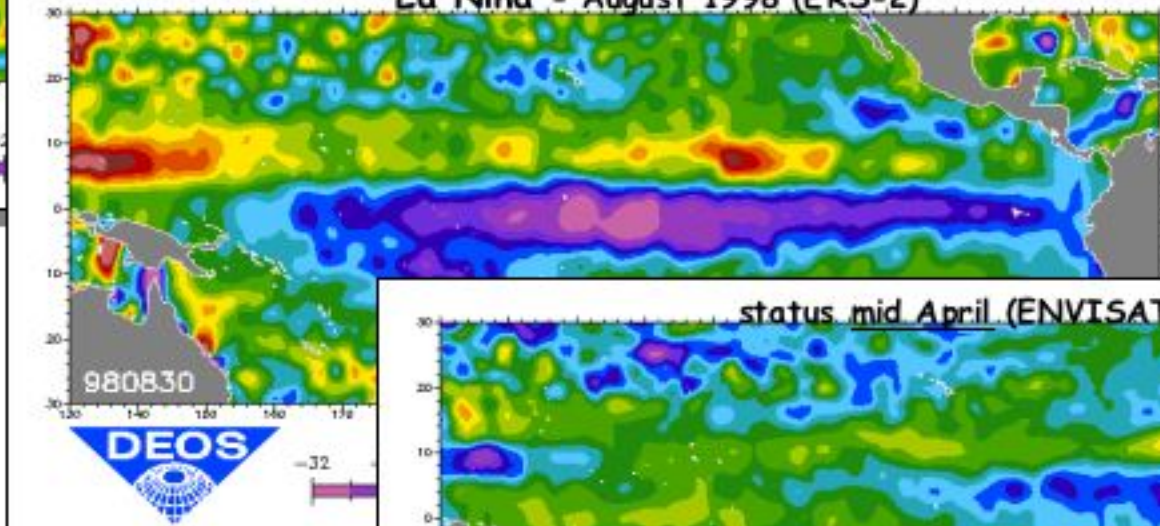
& network of
value adding companies

El Niño - November 1997 (ERS-2)

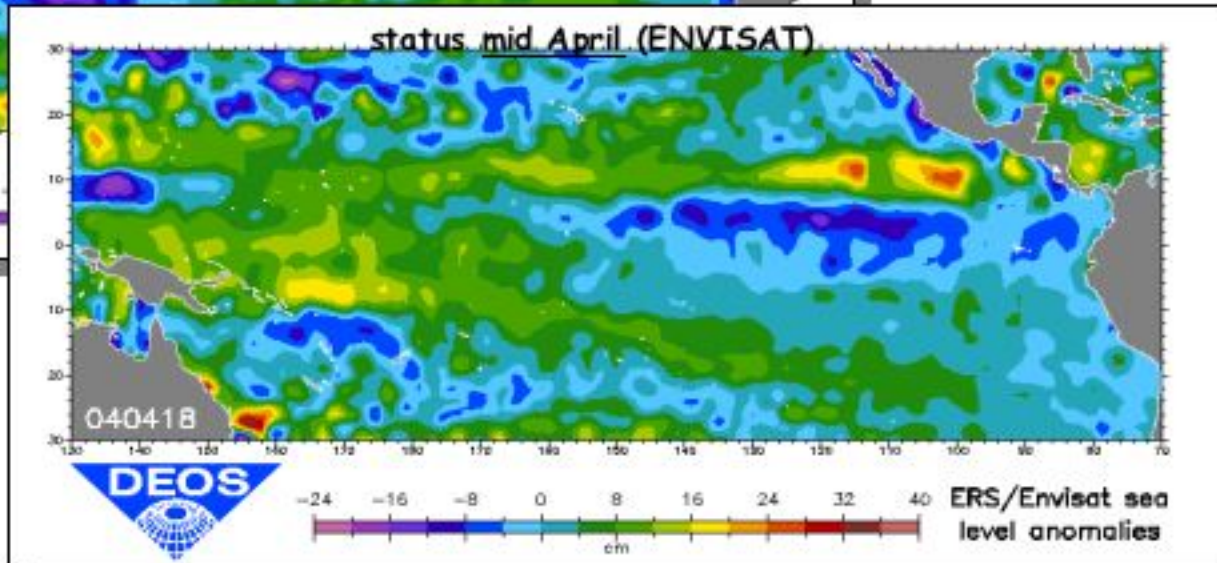


ENVISAT RA-2 has taken over the observations started with the ERS altimeters

La Niña - August 1998 (ERS-2)

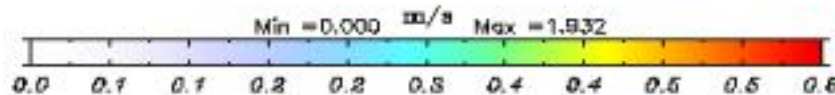
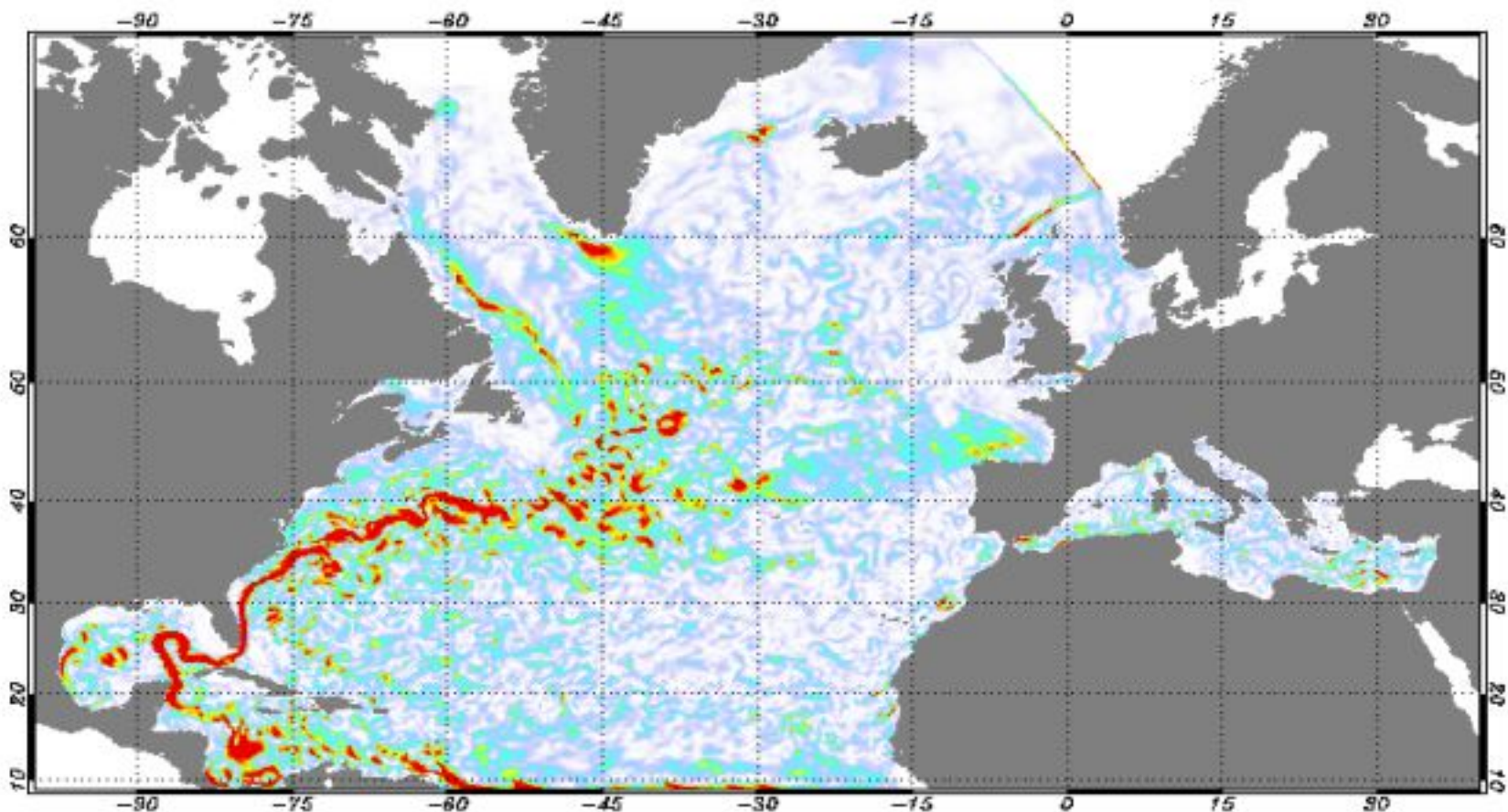


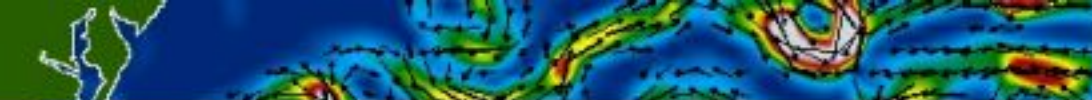
status mid April (ENVISAT)



ENVISAT RA-2 observing the Gulf Stream current velocity (mid-April)

initialised velocity : U on 21-04-2004 near 3m





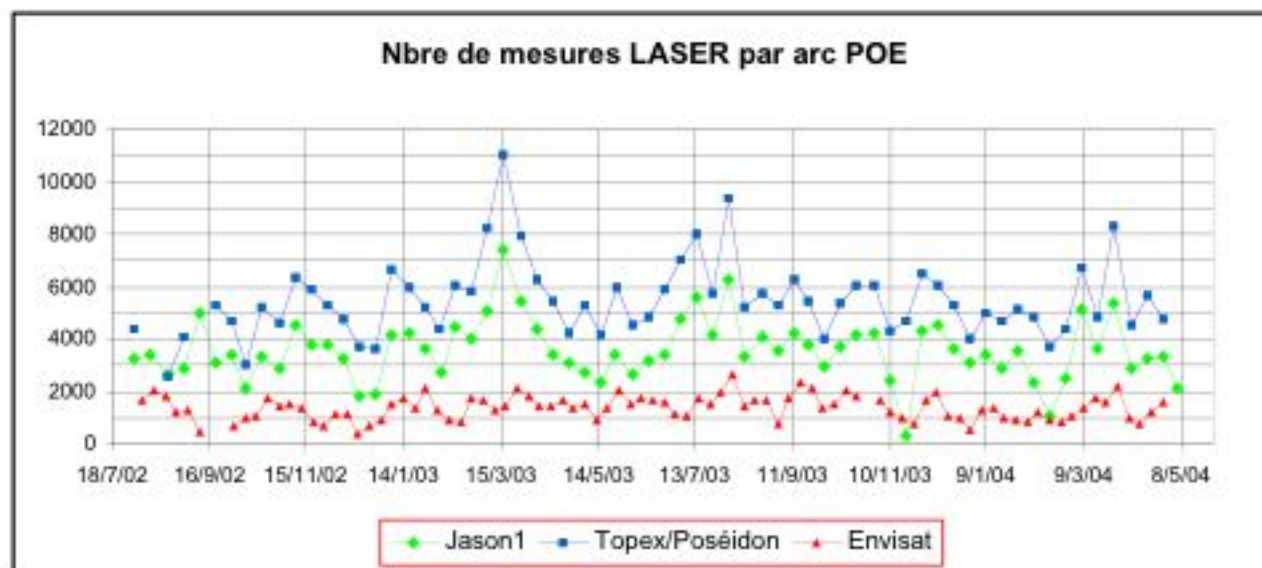
ENVISAT Altimetry System

- Outstanding RA-2, MWR and DORIS sensor availability
- RA2 Sensor continues to perform at a very high level, delivering unprecedented coverage
- High levels of tracker performance reported at Commissioning Phase Review are maintained
- MWR performance nominal (despite 36Ghz drift)
- DORIS instrument performances are excellent
- The quality of products NAV, MOE, POE are also very good

**ALTIMETRY MISSION IN PERFECT SHAPE
MORE PARAMETERS AVAILABLE WRT ERS**

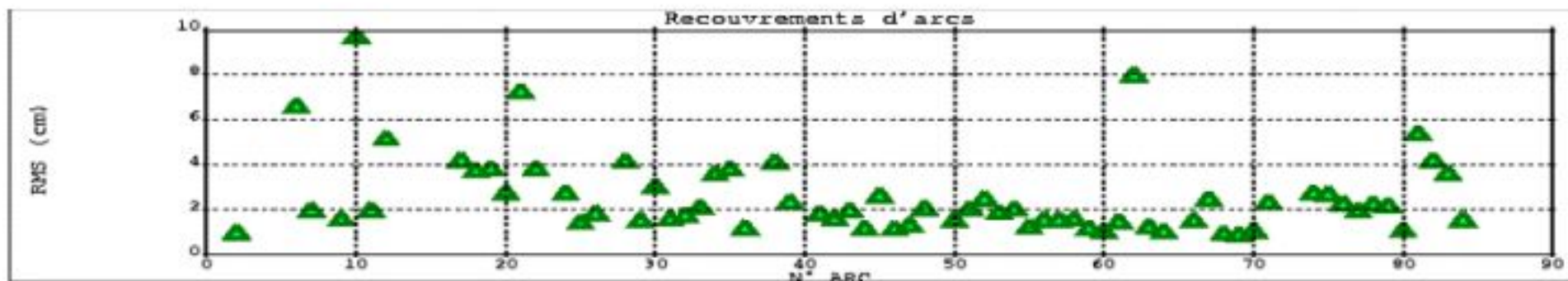
ENVISAT Laser measurements

- General elements
 - There is a significant decrease in SLR tracking (mainly because of the closure and reduced schedule of some NASA stations) since beginning of 2004
 - The SLR+DORIS orbits for Envisat are anyway still doing quite good
 - There is nothing critical at the present time, in terms of orbit performance
 - The situation has to be carefully and continuously monitored in order to verify if any additional decrease in laser tracking impacts the accuracy of the orbit



Preliminary (MOE) & Precise (POE) Orbit Restitution

- MOE accuracy is better than 5 cm RMS radial (when no ground TM data gaps at PDS or satellite event).
- POE laser residuals are about 2 cm RMS radial, this is stable (when no TM data gaps at PDS or satellite event) and very good.
 - Less Laser passes during maneuvers (half the mean value for a 5 day window on maneuver, typically 6/day instead of 12/day)

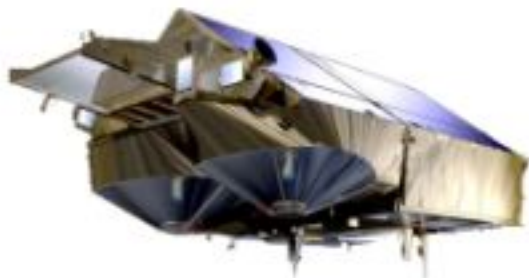


Conclusions

- **ENVISAT POD activity based on DORIS + Laser**
 - => laser data are fundamental for the orbit computation and validation
 - => Decrease in laser tracking but not critical at present time
- **Continuation of the laser measurements (as denser as possible) over the entire mission duration is confirmed to be necessary to ensure highest level science return**

ESA is thankful to all laser stations for their essential contribution to the ENVISAT scientific success

NEXT ESA MISSION: CRYOSAT (Dec 2004)



CRYOSAT

A Mission to Determine Fluctuations in the Mass of the Earth's Land and Marine Ice Fields.

- ERS 1 and ERS 2 demonstrated the capability of radar altimetry to measure the cryosphere:
 - mass balance of Antarctica;
 - thickness of Arctic sea ice.
- CryoSat was conceived ...
 - to continue the measurement series;
 - to rectify limitations of the ERS altimeters.
 - The CryoSat mission will measure long term fluctuations in the mass of the Earth's major land and marine ice fields.

Orbit Definition - Science Phase

- 92° inclination
- 720 km altitude
- NON sun-synchronous
- 369 days repeat cycle
- 30 days sub-cycle (shown)

