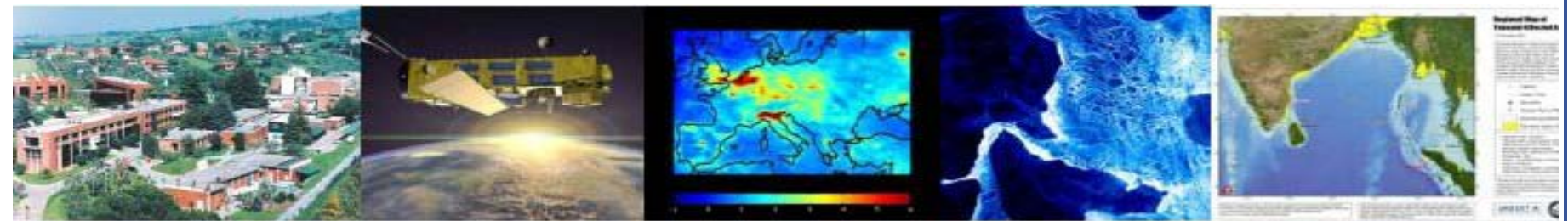


Envisat, Sentinel 1 and Kopernikus status



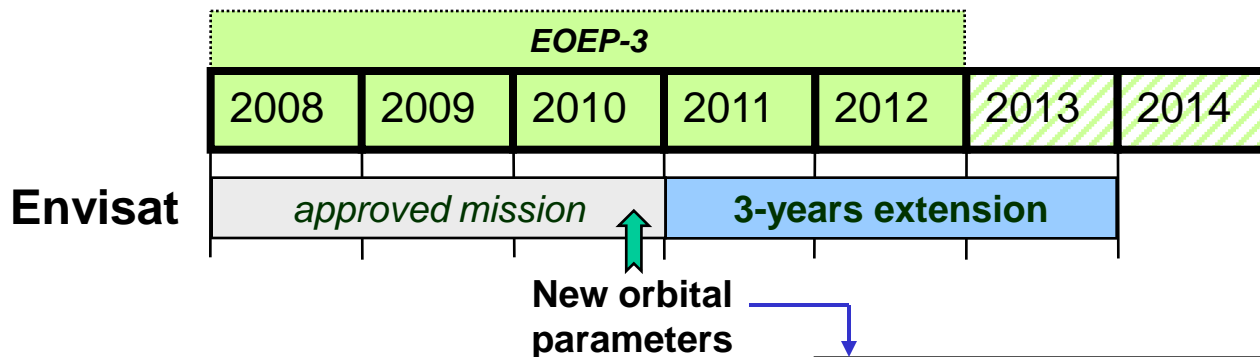
Ola Gråbak

ESRIN-ESA

IICWG IX

October 2008

- The EOEP-3 proposal includes the provision for operating Envisat until 2010.
- However the current Envisat satellite status allows to further extend the operations by 3-years in order to respond to the user communities demand, i.e. until 2013.
- The 3-years extension requests a modification of the Envisat orbital parameters in 2010 as the on-board hydrazine will be almost completely consumed by 2010.
- The Envisat 3-years extension beyond 2010 is currently not funded.



The new orbital parameters allow:

1. to keep current nominal mission until 2010,
2. to extend the mission beyond 2010,
3. to allow operations of all instruments with small or no degradation of their measurements, and minor impact on data quality, excepted for InSAR
4. to commit with the satellite disposal rules.

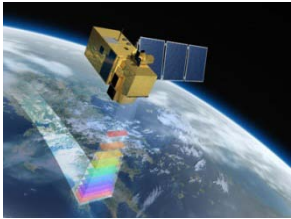
- Altitude change: -17.4 km
- Repeat cycle: 30 days / 431 orbits
- Orbit control: altitude only, inclination drift
- Mean Local Solar Time variation: +/- 10 min.

Kopernikus dedicated missions: Sentinels



Sentinel 1 – SAR imaging

All weather, day/night applications, interferometry



Sentinel 2 – Multispectral imaging

Land applications: urban, forest, agriculture, etc Continuity of Landsat, SPOT data



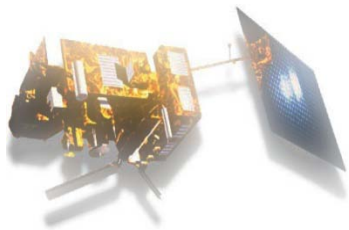
Sentinel 3 – Ocean and global land monitoring

Wide-swath ocean color, vegetation, sea/land surface temperature, altimetry



Sentinel 4 – Geostationary atmospheric

Atmospheric composition monitoring, trans-boundary pollution



Sentinel 5 – Low-orbit atmospheric

Atmospheric composition monitoring



2011



2012



2012



2017+



2019+

Sentinel-1: C-band SAR mission



Applications:

- monitoring sea ice zones and the arctic environment
- surveillance of marine environment
- monitoring land surface motion risks
- mapping in support of humanitarian aid in crisis situations

4 nominal operation modes:

- strip map (80 km swath, 5X5 m res.)
- interferometric wide swath (250 km swath, 20X5 m res.)
- extra wide swath (400 km swath, 25X100 m res.)
- wave (5X20 m res.)

2300 Kg spacecraft mass

Sun synchronous orbit at 693 Km mean altitude

12 days repeat cycle

7 years design life time, consumables for 12 years

Sentinel-1a: launch end 2011

Sentinel-1b: foreseen 2014

- Sentinel-1 Operations aim at satisfying the GMES service requirements in terms of data availability, coverage & revisit, timeliness and quality of its data products through an operational concept based mostly on:
 - the use of a pre-defined acquisition scenario
 - systematic data processing
 - on-line delivery NRT products in less than 1h after downlink
 - access to systematic products through subscription mechanism
 - flexibility
- Sentinel-1 ESA products will include standard L1 products types as well as ocean L2 products.

PRELIMINARY LIST OF OPERATIONAL ESA S-1 PRODUCTS

Product level	Product type	SM	IWS	EW	WV
Level 0	Raw data	√	√	√	√
Level 1	Slant-Range Single-Look Complex	√	√	√	√
	Ground Range Detected	√	√	√	√
	Ground Range Detected Multi-Look	√	√	√	-
	Ground Range Detected Multi-Look Geocoded	√	√	√	-
	Ground Range Detected Multi-Look Orthorectified	√	√	√	-
	Browse products	√	√	√	√
Level 2 (Marine)	Ocean waves/spectra	√	√	√	√
	Ocean surface winds	√	√	√	√

- Definition of overall Sentinel-1 baseline product characteristics is currently on-going.
- Preliminary Ground Range Detected single-look product characteristics:

Mode	Access Angle	Ground Resolution (Range x Azimuth)	Swath Width	Polarisation
Strip Map	20-45 deg.	5 x 5 m, 1 look	> 80 km	HH or VV, or HH+HV or VV+VH
Interferometric Wide Swath	> 25 deg.	5 x 20 m, 1 look	> 250 km	HH or VV, or HH+HV or VV+VH
Extra Wide Swath	> 20 deg.	25 x 100 m, 1x3 looks	> 400 km	HH or VV, or HH+HV or VV+VH
Wave	23 deg & 36 deg	5 x 20 m, 1 look	> 20 x 20 km vignettes at 100 Km intervals	HH or VV

- Ground range detected multi-look products will include standard product types with pre-defined characteristics (e.g. precision with ENL=4 and medium resolution with ENL > 30), with a trade-off between offered spatial and radiometric resolution.
- Some flexibility may be provided to the user to request a modified version of the standard products, selecting between enhancement of spatial or of radiometric accuracy.

- **Segment 1**
Approved

- Sentinel-1 A, Phase B2/C/D/E1
- Sentinel-2 A, Phase B2/C/D/E1
- Sentinel-3 A, Phase B2/C/D/E1
- Ground Segment Developments
- Data Access
- Coordination and Studies

- **Segment 2**
C-MIN 08
Baseline

- Completion of operational Sentinel constellation (S- 1B, 2B, 3B)
- Sentinel 4 (MTG-S): Phase B/C/D incl. processor & 2nd unit
- Sentinel 5 (Post-EPS): Phase B1 & pre-development
- Sentinel 5 pre-cursor (UV-NIR instrument provided by NL)
- Data Access (management, operations & data procurement)
- GS validation & support up to IOV of Sentinel 1B, 2B, 3B
- GSC Evolution Studies
- **Studies on low-inclination altimetry (Jason follow-on)***

The future is...



Copernicus
Observing our planet for a safer world