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Sentinel-3

Operational Oceanography & Global Land Application

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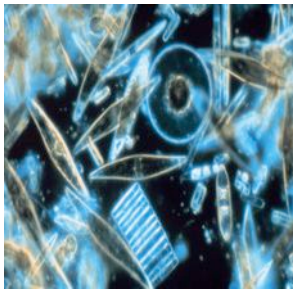
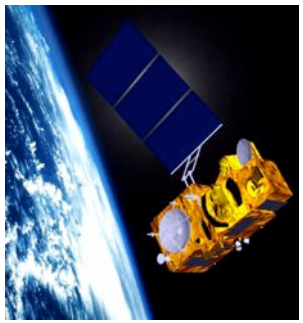
the Living Planet

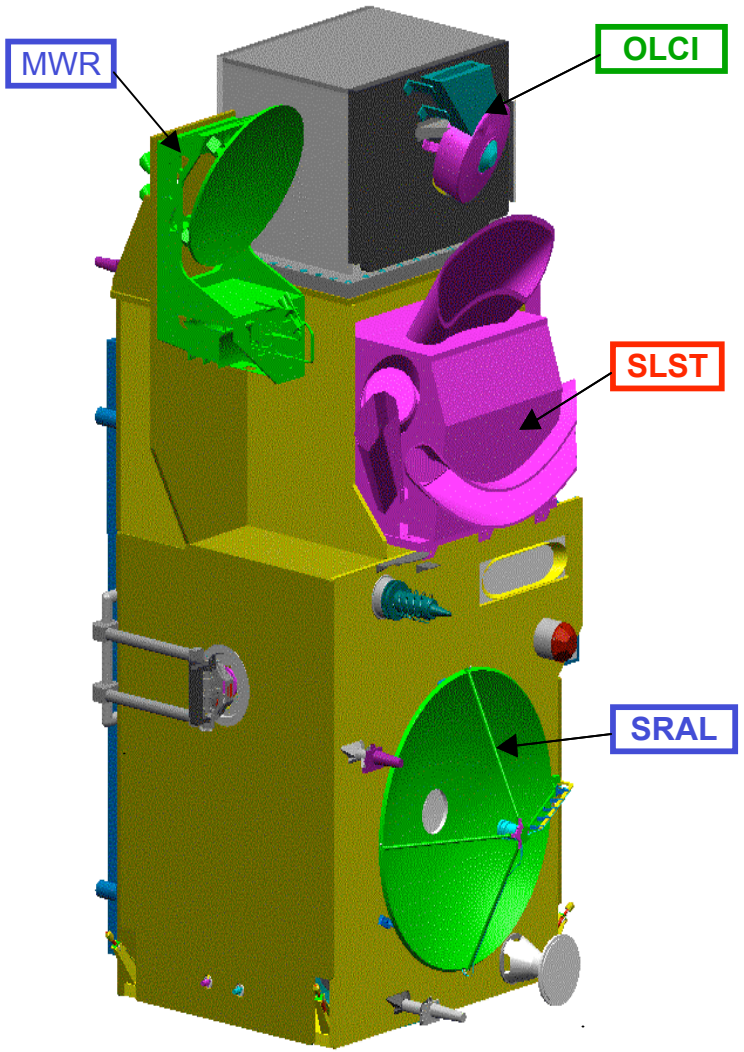
Sentinel-3 overview





- Sentinel-3 is one element of the GMES system.
- Sentinel-3 is an operational mission for oceanography & global land applications.
- Provides continuity of existing missions, delivering:
  - Sea/Land colour data (at least MERIS quality)
  - Sea/Land surface temperature (at least AATSR quality)
  - Sea surface topography data (at least Envisat RA quality)
- Applicable Sentinel-3 user requirements identified through surveys conducted within the relevant user groups:
  - Operational and Institutional Oceanography Groups
  - Oceanographic Research Users
  - Land Users
- A series of satellites, each designed for a lifetime of 7 years, shall provide an operational service over 15 to 20 years
  - Only 1 satellite is in development at this moment

Sentinel-3 instruments



Instruments:

•Ocean and Land Colour Instrument (OLCI) with 5 cameras, 8 bands (only VIS) for open ocean (low res), 15 bands (only VIS) for coastal zones (high res). Spatial sampling: 300m @ SSP

→ *MERIS follow-on*

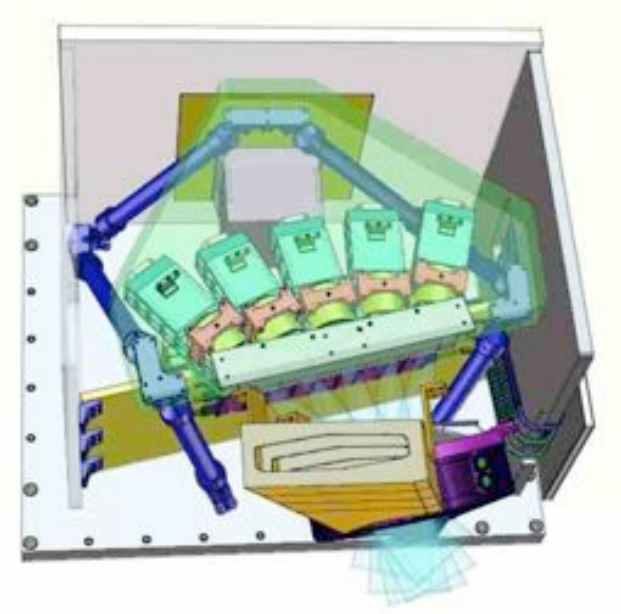
•Sea and Land Surface Temperature (SLST) with 9 spectral bands, 0.5 (VIS, SWIR) to 1 km res (MWIR, TIR). Swath: 180rpm dual view scan, nadir & backwards

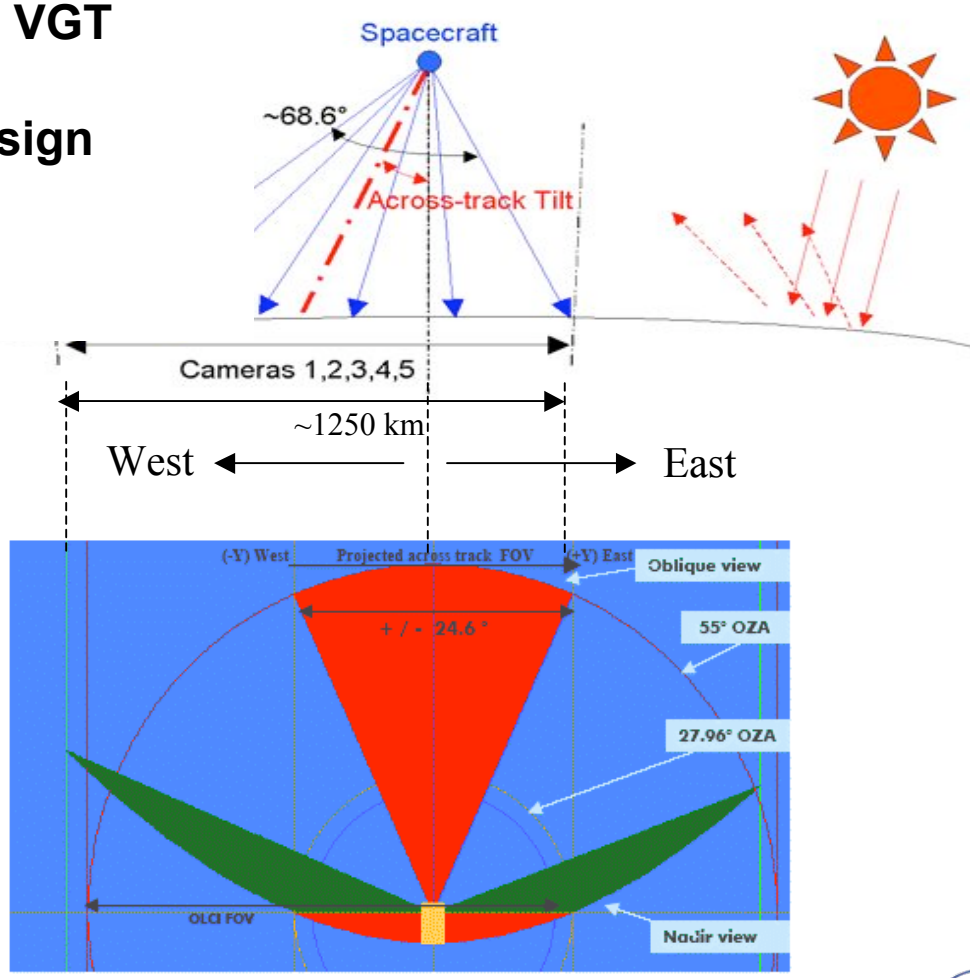
→ *ATSR follow-on*

•**Radar Altimeter package**
SRAL Ku-C altimeter (LRM and SAR measurement modes), MWR, POD (with Laser Retro Reflector and DORIS)

OLCI instrument

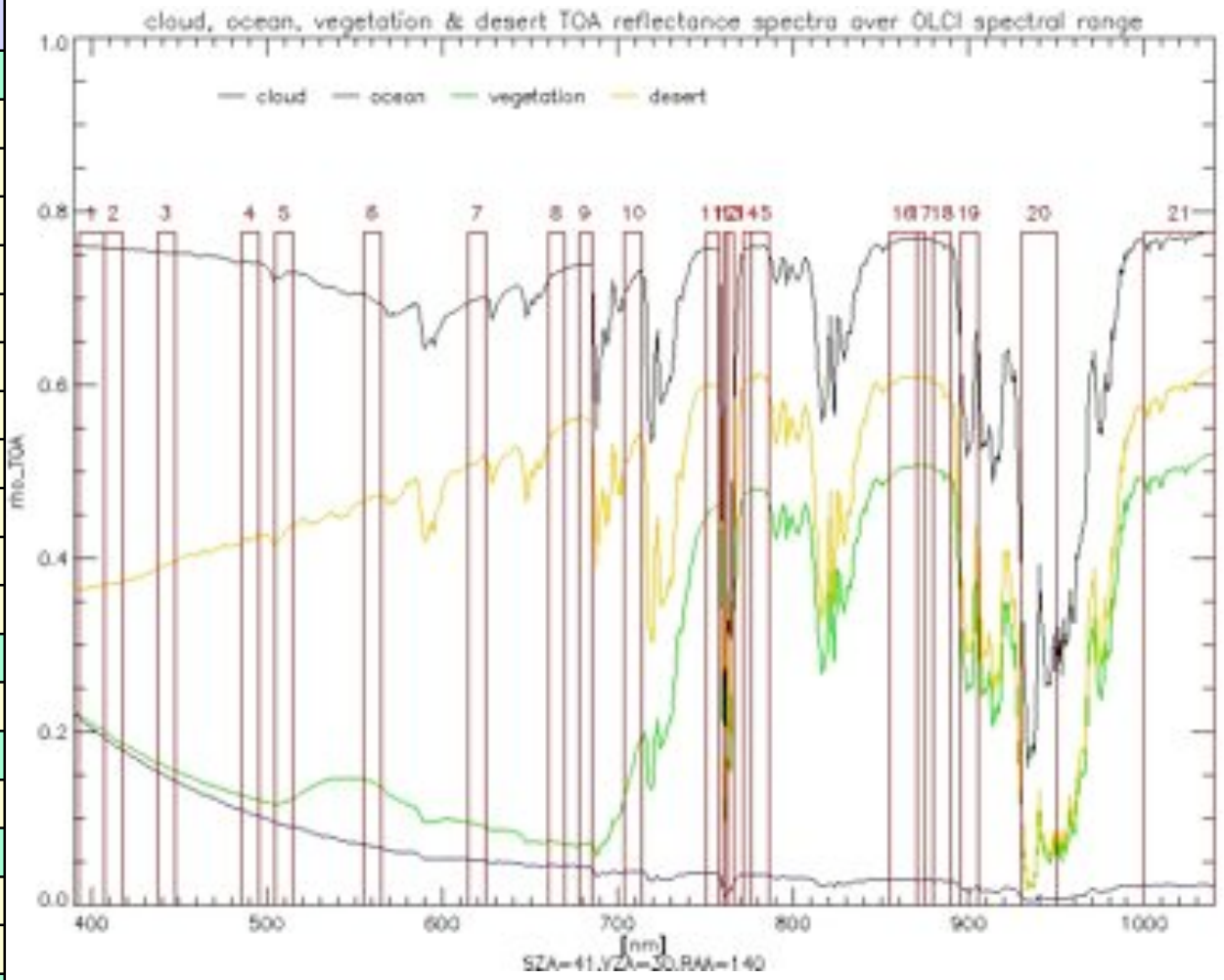
- Heritage from MERIS
- 5 cameras, 21 programmable spectral bands (incl. channels for MERIS & VGT legacy products)
- Sun Glint free configuration by design
- Across-track tilt = 12.20°
- Low polarisation < 1%
- Swath covered by SLST for atmospheric correction





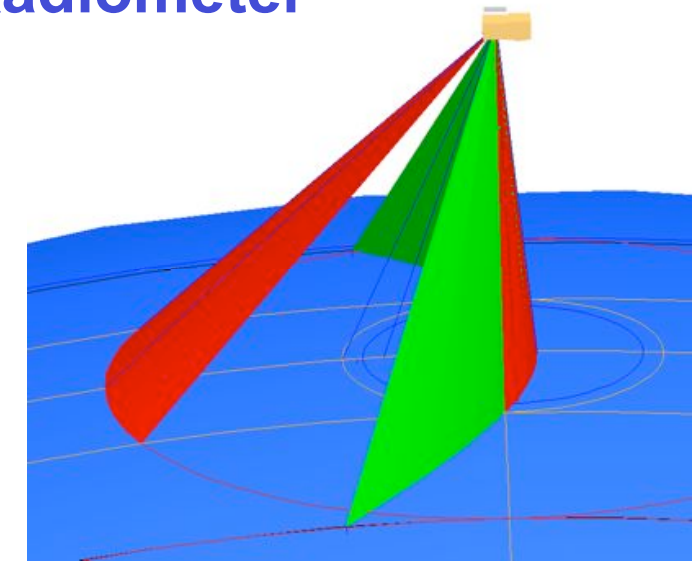
OLCI spectral channels

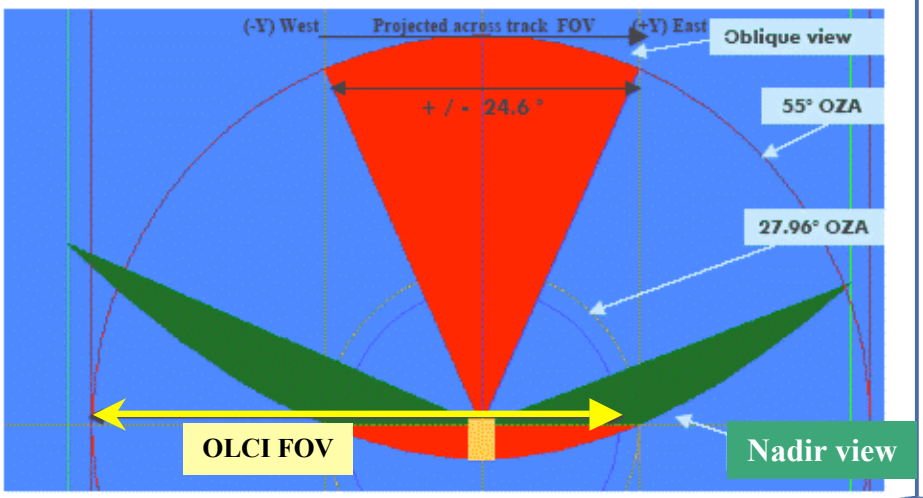
Channel	Central wavelength (nm)	Width (nm)
1	400	15
2	412.5	10
3	442.5	10
4	490	10
5	510	10
6	560	10
7	620	10
8	665	10
9	681.25	7.5
10	708.75	10
11	753.75	7.5
12	761.25	2.5
13	764.375	3.75
14	773.75	5
15	781.25	10
16	862.5	15
17	872.5	5
18	885	10
19	900	10
20	940	20
21	1020	40



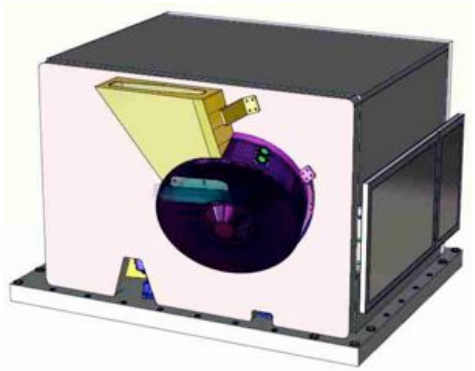
Sea & Land Surface Temperature Radiometer

- Heritage from AATSR, dual-view (nadir & backward) required for aerosol corrections:
  - Nadir swath >74° (up to 1800 km)
  - Dual view swath 49° ~ 750 km
  - Nadir swath covering OLCI
- 9 spectral bands:
  - 3 Visible : 555 – 659 – 865 nm
  - 3 SWIR : 1.38 – 1.61 – 2.25 µm
  - 3 TIR : 3.74 – 10.85 – 12 µm
- One Vis/IR channel used for co-registration with OLCI



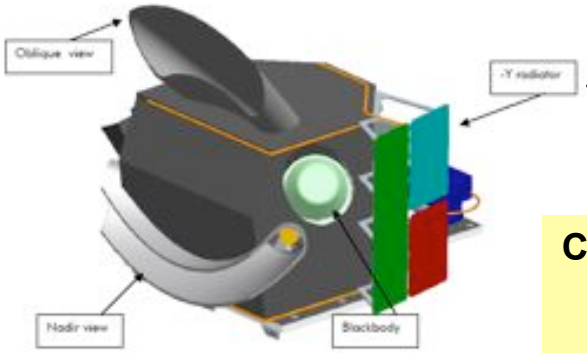


OLCI and SLST spatial resolution



Pushbroom type imager spectrometer
21 Spectral Channels
Full Resolution: Coastal/Land
Reduced Resolution: Open Ocean

OLCI – Open ocean	1.2 km
OLCI – Coastal ocean	300 m
OLCI - Land	300 m
SLST – Solar channels	500 m
SLST – Thermal channels	1 km



Conical scanning imaging radiometer with dual view capability:
- Near-nadir view
- Inclined view with an OZA of 55º ± 0.1º

9 Spectral Channels + 2 (option) for Active FIRE

Sentinel-3 mission orbit

Type:	**Sun-synchronous low earth orbit**
Repeat cycle:	**27 days (14 + 7/27 orbits per day)**
Average altitude:	**814.5 km over geoid**
Mean solar time:	**10:00 at descending node**
Inclination:	**98.65°**

		Revisit at Equator	Revisit for latitude >30°	Specification
Ocean Colour (Sun-glint free)	1 Satellite	**< 3.8 days**	**< 2.8 days**	**< 2 days**
	2 Satellite	**< 1.9 days**	**< 1.4 days**	
Land Colour	1 Satellite	**< 2.2 days**	**< 1.8 days**	**< 2 days**
	2 Satellite	**< 1.1 day**	**< 0.9 day**	
SLST dual view	1 Satellite	**< 1.8 days**	**< 1.5 days**	**< 4 days**
	2 Satellite	**< 0.9 day**	**< 0.8 day**	

- **Near-Real Time (< 3 hrs) availability of the L2 products**
- **Slow Time Critical (1 to 2 days) delivery of higher quality products for assimilation in models (e.g. SSH, SST)**