



Sentinel-3 Surface Topography Mission: Payload, Data Products and Cal/Val Preparation

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Sentinel-3 is an Earth observation satellite mission designed for GMES to ensure the long-term collection of high-quality measurements delivered in an operational manner to GMES ocean, land, atmospheric, emergency and security services.

Primary sentinel-3 topography mission measurement requirements have been derived from GMES user needs as follows:

- Sea surface topography (SSH), significant wave height (Hs) and surface wind speed derived over the global ocean to an equivalent accuracy and precision as that presently achieved by ENVISAT Radar Altimeter-2 (RA-2).
- Enhanced surface topography measurements in the coastal zone, sea ice regions and over inland rivers, their tributaries and lakes.

To address the above requirements, the Sentinel-3 Topography payload will carry a Synthetic Aperture Radar Altimeter (SRAL) instrument, a passive microwave radiometer (MWR) a GPS receiver and laser retro-reflector for precise orbit determination providing continuing the legacy of ENVISAT RA-2 and Cryosat.

Three level of timeliness are defined within GMES for the S-3 Topography mission:

- NRT products, delivered to the users in less than 3 hours after acquisition of data by the sensor,
- Short time critical (STC) products, delivered to the users in less than 48 hours after the acquisition and,
- Non-time critical (NTC) products delivered not later than 1 month after acquisition or from long-term archives.

The Sentinel-3 topography data products will provide continuity of ENVISAT type measurement capability in Europe to determine sea, ice and land surface topography measurements with high accuracy, timely delivery and in a sustained operational manner for GMES users. The Sentinel-3 data will also provide fundamental inputs to a variety of value-adding downstream services for industry, government agencies, commercial users, service providers and appropriate regulatory authorities.

The Calibration and Validation of the Sentinel-3 topography products will nominally rely on the cross-comparison with the ESA Envisat Altimetry mission and will be a significant challenge due to the stringent S-3 mission measurement requirements and their safeguarding all over the mission lifetime.