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Sentinel-3 Mission Overview and Status

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Global Monitoring for Environment and Security (GMES) is designed to provide European policy makers and public authorities with accurate and timely information to better manage the environment, understand and mitigate the effects of climate change and ensure civil security. Sentinel-3 is an Earth observation satellite mission designed for GMES to ensure the long-term collection and operational delivery of high-quality measurements to GMES ocean, land, atmospheric, emergency and security services in continuation of ESA satellite missions like ERS and Envisat. The Sentinel-3 is currently designed with measurement requirements, corresponding to identified user needs from the GMES programme:

- Sea surface topography, significant wave height 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) but with enhanced surface topography measurements in the coastal zone, sea ice regions and over inland rivers, their tributaries and lakes.
- Sea surface temperature determined for oceanic and coastal waters globally to an equivalent accuracy and precision as that presently achieved by the Envisat Advanced Along Track Scanning Radiometer (AATSR) over the ocean (i.e. $<$0.3 K), at a spatial resolution of 1 km.
- Visible, and Short-Wave Infrared radiances for oceanic, inland and coastal waters at a spatial resolution of $\leq$0.3 km (simultaneously and co-registered with SST measurements), determined to an equivalent level of accuracy and precision as Envisat Medium Resolution Imaging Spectrometer with complete ocean coverage in 2-3 days.
- Visible and infrared radiances over global land-surfaces in 1-2 days, sea-ice and ice-sheets equivalent to those currently provided from Envisat MERIS, AATSR and Système Probatoire d'Observation de la Terre (SPOT) Vegetation.

The Sentinel-3 mission addresses these requirements by implementing and operating:

- A dual frequency, delay-Doppler Synthetic Aperture Radar Altimeter (SRAL) instrument supported by a dual frequency passive microwave radiometer (MWR) for wet-tropospheric correction, a GPS receiver and a laser retro-reflector for precise orbit determination.
- A highly sensitive Ocean and Land Colour Imager (OLCI) delivering multi-channel wide-swath optical measurements for ocean and land surfaces.
- A dual-view Sea and Land Surface Temperature Radiometer (SLSTR) delivering accurate surface ocean, land, and ice temperature.
- A distributed ground segment providing Satellite data acquisition and operational production, the mission performance monitoring and the access to core data products in both near real time and off-line delivery context.

The mission foresees a series of satellites, each having 7-year lifetime, over a 20-year period starting with the launch of Sentinel-3A in 2013. During full operations two identical satellites will be maintained in the same orbit with a phase delay of 180°.

This paper provides an overview of the current Sentinel-3 development status. In addition we outline a concept for calibration and validation which is under preparation with the objective to provide operational baseline products with sustained performance monitoring. However the calibration and validation concept shall also ensure high quality data streams for new scientific application outside the current product baseline