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The Copernicus Sentinel-3 Mission and Oceanography: Overview and current status

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Copernicus is a joint initiative of the European Commission (EC) and European Space Agency (ESA), which aims at achieving an autonomous and operational Earth observation capacity. GMES marks the transition from R&D oriented efforts in earth observation towards operational services. The development of the space infrastructure i.e. the Copernicus "space component" for the provision of Earth remote sensing data, is led by ESA. The atmosphere and ocean Sentinel Missions are being prepared in cooperation with EUMETSAT.

Sentinel-3 is an operational mission in high-inclination, low earth orbit for the provision of observational data to marine and land monitoring services. These services include the generation of sea, ice and land surface altimetry products, land and ocean colour products, sea and land surface temperature products, and vegetation products. The operational character of the mission implies a high level of availability of the data products and fast delivery time, which have been important design drivers for the mission.

The Sentinel-3 spacecraft accommodates two large optical instruments - the Ocean and Land Colour Instrument (OLCI) with 21 spectral channels from 0.4 to 1.0_m, and the Sea and Land Surface Temperature Radiometer instrument (SLSTR) with 9 spectral channels from 0.5_m to 13_m in nadir and oblique view directions, and a topography payload consisting of a SAR Radar Altimeter (SRAL) and a Microwave Radiometer (MWR) plus a suite of instruments for precise orbit determination (POD). These instruments will ensure the continuation of important data streams established with ESA's ERS and ENVISAT satellites. Full performance will be achieved with a constellation of two identical satellites, separated by 180 degrees in the same orbital plane.

Two Sentinel-3 satellites are in development with the second satellite launch expected approximately 18 months after the first. The overall service duration is planned to be 20 years and is expected to be fulfilled by a series of several satellites. Currently, the launch of the first Sentinel-3 satellite is planned in late 2014. This paper describes the Sentinel-3 Mission, provides an overview of core user products and reports the current mission status.