



Evaluating the performance of Sentinel-3 SRAL SAR Altimetry in the Coastal and Open Ocean, and developing improved retrieval methods – The ESA SCOOP Project.

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The ESA Sentinel-3 satellite, launched in February 2016 as a part of the Copernicus programme, is the second satellite to operate a SAR mode altimeter. The Sentinel 3 Synthetic Aperture Radar Altimeter (SRAL) is based on the heritage from Cryosat-2, but this time complemented by a Microwave Radiometer (MWR) to provide a wet troposphere correction, and operating at Ku and C-Bands to provide an accurate along-track ionospheric correction.

SCOOP (SAR Altimetry Coastal & Open Ocean Performance) is a project funded under the ESA SEOM (Scientific Exploitation of Operational Missions) Programme Element, started in September 2015, to characterise the expected performance of Sentinel-3 SRAL SAR mode altimeter products, in the coastal zone and open-ocean, and then to develop and evaluate enhancements to the baseline processing scheme in terms of improvements to ocean measurements. There is also a work package to develop and evaluate an improved Wet Troposphere correction for Sentinel-3, based on the measurements from the on-board MWR, further enhanced mostly in the coastal and polar regions using third party data, and provide recommendations for use.

At the end of the project recommendations for further developments and implementations will be provided through a scientific roadmap.

In this presentation we provide an overview of the SCOOP project, highlighting the key deliverables and discussing the potential impact of the results in terms of the application of delay-Doppler (SAR) altimeter measurements over the open-ocean and coastal zone. We also present the initial results from the project, including:

- Key findings from a review of the current “state-of-the-art” for SAR altimetry,
- Specification of the initial “reference” delay-Doppler and echo modelling / retracking processing schemes,
- Evaluation of an initial Test Data Set in the Open Ocean and Coastal Zone, processed from Cryosat FBR data, using a processing scheme designed to be equivalent to the Sentinel-3 baseline processor
- Overview of modifications planned to the reference delay-Doppler and echo modelling/ re-tracking processing schemes.

This work builds on findings from the Cryosat Plus for Oceans (CP4O) study, in which new processing schemes for Cryosat SAR mode data were developed and evaluated with a view to supporting a range of open ocean and coastal zone applications, and continues to be highly relevant to further exploitation of Cryosat data in these applications.

The SCOOP test data sets and relevant documentation are available to external researchers on application to the project team.