SAR Altimetry Processing On Demand Service for CryoSat-2 and Sentinel-3 at ESA G-POD

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The scope of this presentation is to feature the G-POD SARvatore service to users for the exploitation of CryoSat-2 and Sentinel-3 SAR (Delay-Doppler) Altimetry data, which was designed and developed by the Altimetry Team at ESA-ESRIN EOP-SDR. The G-POD service coined SARvatore (SAR Versatile Altimetric Toolkit for Ocean Research & Exploitation) is a web platform that allows any scientist worldwide to process on-line, on-demand and with a user-selectable configuration CryoSat-2 SAR/SARIN and Sentinel-3 SAR data, from L1A (FBR) data products up to SAR/SARin Level 2 geophysical data products.

The G-POD graphical interface allows users to select a geographical area of interest within the time-frame related to the Cryosat-2 SAR/SARin FBR and Sentinel-3 L1A data products availability in the service catalogue. The processor prototype is versatile, allowing users to customize and to adapt the processing according to their specific requirements by setting a list of configurable options. Pre-defined processing configurations (Ocean, Inland Water, Ice and Sea-Ice) are available for the Sentinel-3 service. After the task submission, users can follow, in real time, the status of the processing. The output data products are generated in standard NetCDF format (using CF Convention), therefore being compatible with the Multi-Mission Radar Altimetry Toolbox (BRAT, http://www.altimetry.info/toolbox/) and typical tools. The following upgrades have been recently introduced: 1) Inclusion of SAR echo and SAR RIP (Range Integrated Power) waveforms in the NetCDF files; 2) Inclusion of STACK Data in the NetCDF files.

Initially, the processing was designed and uniquely optimized for open ocean studies. It was based on the SAMOSA model developed for the Sentinel-3 Ground Segment using CryoSat data (Cotton et al., 2008; Ray et al., 2014). However, since June 2015, a new retracker (SAMOSA+) is offered as a dedicated retracker for coastal zone, inland water and sea-ice/ice-sheet. Following the launch of Sentinel-3, a new flavour of the service has been initiated, exclusively dedicated to the processing of Sentinel-3 mission data products. The scope of this new service is to maximize the exploitation of the Sentinel-3 Surface Topography Mission's data over all surfaces providing user with specific processing options not available in the Ground Segment processing chain and most importantly the data storage and the CPU power are resources offered on-line and scalable. The service is open, free of charge (supported by the ESA SEOM Programme Element) for worldwide scientific applications and available at https://gpod.eo.esa.int/services/CRYOSAT_SAR/.

In the last 3 years: 80 SARvatore, 77 SARINvatore and 15 SARvatore for Sentinel-3 Users were supported with: 178428 CPU hours (that's 20.4 years); 175 TB of CryoSat data storage; 14301/506 processing tasks submitted for SARvatore/SARINvatore; 152 processing tasks submitted for Sentinel-3; 91 TB/ 8 TB of input products processed by SARvatore/SARINvatore tasks; Output produced: 3.3 TB/32 GB; 8.4 TB of input products processed by Sentinel-3 tasks; Output produced: 37 GB.