Launched in 2010, the European Space Agency's (ESA) polar-orbiting CryoSat satellite was specifically designed to measure changes in the thickness of polar sea ice and the elevation of the ice sheets and mountain glaciers. Beyond the primary mission objectives, CryoSat is also a valuable source of data for the oceanographic community and CryoSat's sophisticated SAR Interferometric Radar Altimeter (SIRAL) can measure high-resolution geophysical parameters from the open ocean to the coast.

CryoSat data is processed operationally using two independent processing chains: Ice and Ocean. To ensure that the CryoSat products meet the highest data quality and performance standards, the CryoSat Instrument Processing Facilities (IPFs) are periodically updated. Processing algorithms are improved based on feedback and recommendations from Quality Control (QC) activities, Calibration and Validation campaigns, the CryoSat Expert Support Laboratory (ESL), and the Scientific Community.

Since May 2019, the CryoSat ice products are generated with Baseline-D, which represented a major processor upgrade and implemented several improvements, including the optimisation of freeboard computation in SARIn mode, improvements to sea ice and land ice retracking and the migration from Earth Explorer Format (EEF) to Network Common Data Form (NetCDF). A reprocessing campaign is currently underway to reprocess the full mission dataset (July 2010 – May 2019) to Baseline-D.

The CryoSat ocean products are also generated in NetCDF, following a processor upgrade in November 2017 (Baseline-C). Improvements implemented in this new Baseline include the generation of ocean products for all data acquisition modes, therefore providing complete data coverage for ocean users. This upgrade also implemented innovative algorithms, refined existing ones and added new parameters and corrections to the products. Following the completion of a successful reprocessing campaign, Baseline-C ocean products are now available for the full
mission dataset (July 2010 – present).

Since launch, the CryoSat ice and ocean products have been routinely monitored as part of QC activities by the ESA/ESRIN Sensor Performance, Products and Algorithms (SPPA) office with the support of the Quality Assurance for Earth Observation (QA4EO) service (formerly IDEAS+) led by Telespazio VEGA UK. The latest processor updates have brought significant improvements to the quality of CryoSat ice and ocean products, which in turn are expected to have a positive impact on the scientific exploitation of CryoSat measurements over all surface types.

This poster provides an overview of the CryoSat data quality status and the QC activities performed by the QA4EO consortium, including both operational and reprocessing QC. Also presented are the main evolutions and improvements that have implemented to the processors, and anticipated evolutions for the future.