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Improved Oceanographic Measurements from SAR Altimetry: Results and Scientific Roadmap from the ESA CryoSat Plus For Oceans Project

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The ESA CryoSat mission is the first space mission to carry a radar altimeter that can operate in Synthetic Aperture Radar (SAR) mode. It thus provides the first opportunity to test and evaluate, using real data, the significant potential benefits of SAR altimetry for ocean applications.

The objective of the CryoSat Plus for Oceans (CP4O) project was to develop and evaluate new ocean products from CryoSat data and so maximize the scientific return of CryoSat over oceans. The main focus of CP4O has been on the additional measurement capabilities that are offered by the SAR mode of the SIRAL altimeter, with further work in developing improved geophysical corrections.

CP4O has developed SAR based ocean products for application in four themes: Open Oceans, Coastal Oceans, Polar Oceans and Sea Floor Topography. The team has developed a number of new processing schemes and compared and evaluated the resultant data products. This work has clearly demonstrated the improved ocean measuring capability offered by SAR mode altimetry and has also added significantly to our understanding of the issues around the processing and interpretation of SAR altimeter echoes.

The project finished in 2014, so this paper presents an overview of the major results and outlines a proposed roadmap for the further development and exploitation of these results in operational and scientific applications.

The results are of course also highly relevant to support the planning for future missions, including Sentinel-3 and Jason-CS/Sentinel-6.

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