



## **Cryosat-2 SAR and SAR-In Altimetry for Coastal Sea Level**

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Cryosat-2 offers the first ever possibility to perform coastal altimetric studies using SAR-Interferometry as well as SAR altimetry. With this technological leap forward Cryosat-2 is now able to observe sea level in very small water bodies and also to provide coastal sea level very close to the shore.

We perform an investigation into the retrieval of sea surface height around Denmark and Greenland. These regions have been chosen as the coastal regions around Denmark falls within the SAR mask and the coastal regions of Greenland falls in under the SAR-in mask employed on Cryosat-2. SAR-in was mainly used in coastal regions of Greenland because of its huge topographic changes as Cryosat-2 is designed to map the margins of the ice-sheet. The coastal region around Denmark is a test region of the EU sponsored project LOTUS in which

With the increased spatial resolution of Cryosat-2 SAR we provide valuable sea level observations within the Straits around Denmark which are crucial to constrain the waterflow in and out of the Baltic Sea.

The investigation of SAR-in data in Greenland adds an entire new dimension to coastal altimetry. An amazing result of the investigation is the ability of Cryosat-2 to detect and recover sea level even though the coast (sealevel) is up to 15 km away from the nadir location of the satellite.

This ability of capture and use returns from outside the main (-3Db) loop in theory enables Cryosat-2 SAR-in to map sea level height of fjords more frequently than the 369 days repeat.