



Seasonal sea surface and sea ice signal in the fjords of Eastern Greenland from CryoSat-2 SARin altimetry

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Cryosat-2 offers the first ever possibility to perform coastal altimetric studies using SAR-Interferometry. This enabled qualified measurements of sea surface height (SSH) in the fjords in Greenland. Scoresbysund fjord on the east coast of Greenland is the largest fjord in the world which is also covered by CryoSat-2 SAR-In mask making it a good test region. Also, the tide gauge operated by DTU Space is sitting in Scoresbysund bay, which provides solid ground-based sea level variation records throughout the year.

We perform an investigation into sea surface height variation since the start of the Cryosat-2 mission using SAR-In L1B data processed with baseline B processing. We have employed a new develop method for projecting all SAR-In observations in the Fjord onto a centerline up the Fjord. Hereby we can make solid estimates of the annual and (semi-) annual signal in sea level/sea ice freeboard within the Fjord.

These seasonal height variations enable us to derive sea ice freeboard changes in the fjord from satellite altimetry. Derived sea level and sea-ice freeboard can be validated by comparison with the tide gauge observations for sea level and output from the Microwave Radiometer derived observations of sea ice freeboard developed at the Danish Meteorological Institute.