



Activities within DEOS related to the Cryosat Mission

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The Cryosat mission offers the possibility of a new ocean and ice mapping altimeter system which we plan to incorporate in our Radar Altimeter Database System (RADS). A first use of the SIRAL Low Resolution Mode (LRM) data concerns a range and time tag bias estimation with the help of models and other altimeter data in our database. In a similar way, systematic differences in other SIRAL LRM observed quantities can be analyzed. Particular focus will be on the Significant Wave Height (SWH) and normalized radar backscatter (σ_{naught}), which are both required for the sea state bias estimation of the altimeter. A comparison with in situ buoys and tide gauges offers the possibility of an independent external validation of SIRAL LRM observation data. This will be a joint activity between the TU Delft and the Ohio State University. A second activity will be the Cryosat precise orbit determination and verification, which is entirely based on Satellite Laser Ranging (SLR) and Doppler tracking (DORIS). The work will include the development of an accurate ANGARA surface force model and an orbit comparison campaign, with special focus on the specific Cryosat mission goals. Based on our experience in precise orbit determination for ERS and Envisat, we aim for a radial orbit error accuracy of better than 3 cm, which is essential for application of the SIRAL LRM data in combination with current ocean altimeter missions. In our opinion, Cryosat will play an important role in estimating the mass budget over the polar ice sheets, including Greenland. Therefore we envisage geophysical applications where we expect that estimates of ice topography changes as measured by Cryosat will play a role in research activities focusing on the identification of sea level change contributors.