Improved POD for Envisat at ESOC by latest reference frame and new mean and time-variable gravity field models

M. Otten (1), **E. Schoenemann** (2), L. Fenoglio-Marc (2), R. Zandbergen (1), J. Dow
(1), M. Becker (2)

(1) Navigation Support Office, European Space Operations Centre, Germany
(Michiel.Otten@esa.int, John.Dow@esa.int / Phone +49-6151-90-2523), (2) Institut fuer
Physikalische Geodaesie, Technische Universitaet Darmstadt, Germany
(Schoenemann@ipg.tu-darmstadt.de, Becker@ipg.tu-darmstadt.de / Phone
+49-6151-16-4511)

The Navigation Support Office at the European Space Operations Centre (ESA/ESOC) in Darmstadt performs routine operational precise orbit determination (POD) for Envisat for many years now. As part of the work performed for the Envisat Radar Altimeter Quality Working Group (QWG) and the foreseen reprocessing of all ESA Altimeter missions under the GMES project, a reprocessing of the precise Envisat orbits over 5 years has been carried out, using the latest ITRF (2005) and various gravity field models such as GRIM5, and the latest EIGEN series.

Based on the reprocessing we will investigate the impact of different gravity field models, as well as the impact of time-variable gravity terms on the precise orbit determination (POD). In a first step we will analyse the satellite laser ranging (SLR) one-way residuals, which give us a first hint of the orbit performance. To asses the internal orbit consistency we will furthermore analyse the orbit overlap in radial, cross- and along-track direction whereby the radial direction is the most important one for satellite altimetry. Finally we will employ satellite crossover altimetry, as an independent quality assessment of the different orbits. The poster will also address the spatial distribution of the found orbit improvements in view of the known spatially correlated altimetry error patterns.