



Gravity field models derived from Swarm GPS data

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The GPS instruments on-board the three Earth's Magnetic Field and Environment Explorer (Swarm) satellites provide the opportunity to measure the gravity field model at basin-wide spatial scales. In spite of being a geo-magnetic satellite mission, Swarm's GPS receiver collects highly accurate hl-SST data (van den IJssel et al., 2015), which has been exploited to produce gravity field models at a number of institutes, namely at the Astronomical Institute (ASU) of the Czech Academy of Sciences (Bezděk et al., 2014), the Astronomical Institute of the University of Bern (AIUB, Jäggi et al., 2015) and the Institute of Geodesy (IfG) of the Graz University of Technology (Zehentner et al., 2015).

With the help of GRACE gravity field models, which are derived from much more accurate ll-SST data, we investigate the best combination strategy for producing a superior model on the basis of the solutions produced by the three institutes, similarly to the approach taken by the European Gravity Service for Improved Emergency Management project (<http://egsiem.eu>). We demonstrate that the Swarm-derived gravity field models are able to resolve monthly solutions with 1666km spatial resolutions (roughly up to degree 12). We illustrate how these monthly solutions correlate with GRACE-derived monthly solutions, for the period of 2014 – 2015, as well as indicate which geographical areas are measured more or less accurately.