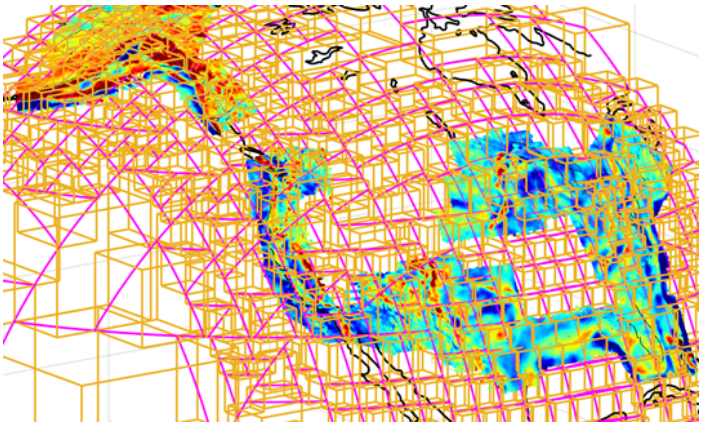
IAMG *Student Chapter*
Freiberg & **Dresden**

TALK ANNOUNCEMENT

The IAMG[1] student chapter Freiberg & Dresden[2] will be hosting a talk.

date:	Thursday, 27 May 2021, 5:30 p.m.
place:	online meeting room[3]
room:	Big Blue Button[3]
title:	**Gravity Field Processing: From Observations to Global Models**
presenter:	**MSc. Philipp Zingerle (TU München)**



Within this contribution we present a method that allows a smooth integration of in-situ ground gravity observations into high-resolution global models up to d/o 5400 (2' global resolution). The functionality is shown on the example of the airborne GRAV-D gravity dataset which is integrated into a global satellite-topographic spherical harmonic model.
Conceptually, the method is divided into three steps: firstly, since the processing based on residuals, a precursor model needs to be identified which is used for reducing the observations. In the actual example a combination between a satellite-only model (GOCO06s) and topographic model (EARTH2014) is chosen (named SATOP2) to ensure independency to the observations. Secondly, the previously reduced (GRAV-D) observations are gridded onto a regular geographic grid making use of the recently developed partition-enhanced least squares collocation approach (PE-LSC). PE-LSC allows an efficient collocation of virtually arbitrary large datasets using a partitioning technique that is optimized for computational performance and for minimizing fringe effects. As third and last step, the obtained regular grid gets analyzed and combined with a satellite-only model (GOCO06s) on normal equation level up to d/o 5400. This can be achieved efficiently by using a so-called kite-normal equation system which emerges when combining dense and block-diagonal normal equation systems (assuming equal accuracies for the ground gravity grid).
The herby obtained global gravity field model, named SGDT, is dominated by the satellite information in the lower frequencies (up to d/o 200), by GRAV-D in the mid-frequencies (d/o 200-2000) and by the topographic information in the high frequencies (above d/o 2000). The main purpose of the SGDT model is to validate the method itself and to allow a comparison of GRAV-D observations to pre-existing ground-gravity data by synthesizing SGDT to actual observation sites.

[1] International Association of Mathematical Geosciences (IAMG), https://iamg.org

[2] https://tu-freiberg.de/iamg

[3] https://selfservice.zih.tu-dresden.de/l/link.php?m=117175&p=b367cc30Teilnehmende (with ZIH (TU Dresden) login)

[3] https://selfservice.zih.tu-dresden.de/link.php?m=117175&p=3477eea7 (without TUD login)