S08b/S08c Lithosphere Structure and Dynamics: Lithospheric Stress and Strain - Observations and Modelling, Plate Boundary Deformation at Lithospheric Scale

IASPEI (Seismology, Geophysics)

29-Jun-2015, 15:00 - 16:30

Abstract number: IUGG-3461
https://www.czech-in.org/cm/IUGG/CM.NET.WebUI/CM.NET.WEBUI.scpr/SCPRfunctiondetail.aspx?confID=05000000-0000-0000-0000-000000000053&sesID=05000000-0000-0000-0000-000000003296&absID=07000000-0000-0000-0000-000000024770

Abstract content:

"Development of Tibetan crustal structure models from the data of satellite gravity missions"

We present recent progress in the study of crustal modelling from the data of state-of-the-art satellite gravity missions, which successfully revealed the particular features of the crust-mantle boundary reflecting the compressional tectonic environment. We analysed a multitude of global gravity models up to the year 2014 since 2004. They utilized at least one of the two missions: the Gravity field and Ocean Circulation Explorer (GOCE) and/or the Gravity Recovery And Climate Experiment (GRACE). GOCE, equipped with state-of-the-art gradiometer, was launched by European Space Agency in 2009, and orbits as close to Earth as possible to maximize its sensitivity to variations in Earth's gravity field, while GRACE mission, a joint mission of NASA and the German Aerospace Center, was launched in March 2002 and has two identical spacecrafts flying about 220 km apart in a polar orbit. Formerly Shin et al. (2007, 2009) have revealed three-dimensional models of the Tibetan Mohorovicic discontinuity (Moho and its mountain-ranges-like structure) and its folding structure, on the analogy of lithospheric folding, successfully from the data of GRACE mission. In addition to their models, our recent analysis shows that there are noticeable advances from the GOCE mission than the earlier models, by disclosing the more evident directionality of Moho ranges and folds and by reducing discontinuities of isolated highs and lows that have been found in the former models.
Reference: [1] Shin, Y. H. et al., 2009, Three-dimensional fold structure of the Tibetan Moho from GRACE gravity data. Geophys. Res. Lett., 36, L01302, doi:10.1029/2008GL036068. [2] Shin, Y. H. et al., 2007, Moho undulations beneath Tibet from GRACE-integrated gravity data. Geophys. J. Intl., 170, 971-985.

Author(s):

Y. Shin[1], C.K. Shum[2], C. Braitenberg[3], S.M. Lee[4], S.H. Na[5], K.S. Choi[6], H. Xu[7], Y.S. Park[1], M. Lim[1].
[1]KIGAM, Mineral Resource Research Division, Daejeon, Korea- Republic of Korea.
[2]Ohio State University, School of Earth Sciences, Columbus, USA.
[3]University of Trieste, Dept. of Earth Mathematics and Geosciences, Trieste, Italy.
[4]Seoul National University, School of Earth & Environmental Sciences, Seoul, Korea- Republic of Korea.
[5]University of Science and Technology, Astronomy and Space Science, Daejeon, Korea- Republic of Korea.
[6]Pusan National University, Dept. of Earth Science, Busan, Korea- Republic of Korea.
[7]Institute of Geodesy and Geophysics- CAS, Key Laboratory of Dynamic Geodesy of CAS, Wuhan, China Peoples Republic.

Keywords:
Tibet Moho fold Moho ranges Moho topography Lithospheric folding GOCE GRACE Gravity Field