Geophysical Research Abstracts
Vol. 15, EGU2013-1126-2, 2013
EGU General Assembly 2013


# Evaluation of Height System Biases for Regional Levelling Network in Saudi Arabia Using EGM08 and GOCE Models

Abdulaziz Alothman (1), Thomas Gruber (2), and Johannes Bouman (3)

(1) King Abdulaziz City for Science and Technology, ECP, Geodesy and Geophysics, Riyadh, Saudi Arabia (aalothman@kacst.edu.sa), (2) Institut für Astronomische und Physikalische Geodäsie (IAPG), Technical University Munich, Germany, (3) Deutsches Geodätisches Forschungsinstitut (DGFI), Munich, Germany

In order to estimate an accurate national geoid model for Saudi Arabia, existing regional levelling data will be utilized. These data consist of about 5898 Bench Marks (BM) of ARAMCO network distributed all over the country and was observed by GPS receivers, known hereafter as BM/GPS. The levelling network is dense in the eastern region while in other areas, especially in the western region, data coverage is sparse. The vertical datum is based on the mean sea level (MSL) at RasTanura Tidal BM in the East coast of the region (i.e. in the Arabian Gulf). We expect that this regional vertical reference system differs from the global reference system. We present the evaluation of this regional levelling network using satellite based geopotential models (GPM). For this study the EGM2008 model as well as the most recent GOCE GPMs will be used, which provide a homogeneous reference surface. To estimate the height system biases, we compare the height anomalies determined by GNSS/Levelling at each point to those computed (synthesized) by the GPMs. Statistical analyses of the computation, mean values and RMS, will be shown. Finally, we will directly compare GPM geoids and the GNSS/Levelling data at different spatial resolutions in order to validate the GNSS/Levelling data. The conclusion of this study will show the biased (rejected) sites and the suitability of GOCE model to carry out regional geoid modelling.