Geophysical Research Abstracts,
Vol. 11, EGU2009-6783-1, 2009
EGU General Assembly 2009

Densification of gravity networks in Iran: 2nd and 3rd order gravity networks

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Gravity data has been collected by Iranian National Cartographic Center (NCC) during the previous decades. The oldest gravity data are now maintained by BGI in France. During the last three decades, attempts were done to gather more gravity data by precise gravity measurements on Iranian first order leveling network. Lack of absolute gravity stations, precise first order gravity network and reliable calibration line makes these data to be unreliable. Also relying only on roads make the data set to be correlated with them and so the data would be inhomogeneous. Since few years ago, NCC established the zero order gravity network with all the stations measured with FG5 in absolute sense. Besides, NCC designed and established first order gravity network in Iran with 55 km distance between the stations which consists of 700 stations. It is needless to say that much more densification is required for precise modeling of the gravity field and geoid computation. Therefore, 2nd and 3rd order gravity networks were designed in 2008. Establishment and measurements of these networks are under progress and all the project is assumed to be completed in 6 years. These gravity networks are connected to the 1st and zero order gravity networks by relative gravity measurements. Networks are also designed to be on regular grids as possible for homogeneously covering the country. Gravity data from these networks will enhance modeling the gravity field of the earth and geoid in future. Besides, it can be used for calibration of the data from space missions like GOCE in this region.