



A proposal for establishment and application of multi-sensor geodesy stations for geodynamics studies

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Recent years have seen the importance of geodynamics studies for reduction of natural hazards and prevention of disasters caused by, for example, landslides, ground-failures and mass movements induced by earthquakes and volcanic activity. In geodynamics, like any other physical sciences, the success of the modeling and prediction is based on adequacy and reliability of observations. One of the main sources of information in geodynamics is geodesy in terms of both geometrical and physical observations. So far, the main contribution of the geodesy to geodynamics has been through scalar gravity observations (norm of gravity acceleration through gravimetry), positioning (coordinates of the points via terrestrial and satellite techniques), geodetic astronomy (to provide direction of the gravity vector via astronomical longitude and astronomical latitude), and height information (through precise leveling, comprised of leveling accompanied by gravimetry). Besides, mostly, geodynamical studies have been based on aforementioned observations being made at the separate observation points. However, due to complexity of the nature of the Earth, a reliable, comprehend and global conclusion about the dynamics of the Earth could never be inferred, unless the results are confirmed via various observational techniques. Owing to this fact, we have proposed and practically implemented multi-sensor geodesy stations where GPS, gravity, astronomical longitude and latitude, and precise leveling observations are all observed at a common observation point on the surface of the Earth. The first geodesy station furnished with mentioned observations was established at the University of Tehran (Tehran/Iran) during the years 2005 and 2006 and the observations of the first year of that station were processed. In this paper we are going to share our early results and experiment with the application of multi-sensor geodesy stations from geodynamics studies.