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Computing a precise local geoid for Iran by using gravity, GPS-leveling and geopotential models

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Geoid surface as an equipotential surface which is the best fitted one to the mean sea surface has been used and accepted as an appropriate height reference. Having an exact geoid, one can determine the Orthometric height using a GPS device quickly, easily and with less cost. So, after the invention of the GPS, there was an increasing interest toward calculation of the exact geoid. In this project, the local geoid for an area located at the western Iran is computed and the results would be presented. The focus of the project is on the short waves of the geoid. The impact of the direct topography effect on gravity data and the indirect topography effect on geoid are considered. The geoid's long waves are determined using the recent global geopotential models and the final geoid is compared and validated with GPS-levelling data. GPS-levelling data is then used to improve the geoid for leveling purposes. The new surface (which can not be called geoid anymore) is a proper surface for the users who needs orthometric heights from GPS.