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Precision Assessment of the Orthometric Heights Determination in the Northern Part of Libya

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Abstract : The Global Positioning System (GPS) satellite-based technology has been utilized extensively in the last few years in a wide range of Geomatics and Geographic Information Systems (GIS) applications. One of the main challenges dealing with GPS-based heights consists of converting them into Mean Sea Level (MSL) heights which is used in surveys and mapping. In this research work, differences in heights of 50 points, in northern part of Libya were carried out using both ordinary levelling (in which Geoid is the reference datum) and GPS techniques (in which Ellipsoid is the reference datum). In addition, this study has utilized the EGM2008 model to obtain the undulation values between the ellipsoidal and orthometric heights. From these values with ellipsoidal heights which can be obtained from GPS observations to compute the orthomteric heights. This research presented a suitable alternative, from an economical point of view, to substitute the expensive traditional levelling technique particularly for topographic mapping.

Keywords : geoid undulation, GPS, ordinary and geodetic levelling, orthometric height
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