

Contribution of satellite altimetry data in the geophysical investigation of the Red Sea region, Egypt

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A b s t r a c t

Successful development of geodetic satellite missions has aroused new interest in determining global and regional gravity field based on satellite data. Satellite altimetry data enable direct determination of the geoid over sea regions.

In Egypt, where land and marine geophysical data are inadequate because of rough topography and economic reasons, the use of satellite altimetry data is of special importance.

The northern Red Sea region has been selected as a site for case study of the current research, after applying spectral analysis to reveal near-surface structure, the residual geoid of the studied region shows a good correlation with the known geologic features. Moreover, satellite-based gravity data enhance small-scale features and agrees well with land and marine gravity data. Thus, geoid undulation and satellite gravity data can be a complementary source of data to determine near-surface and deep structures.

Key words: satellite altimetry data, Red Sea, geoid, free air gravity.