

Determination Secondary Effects of the Ocean Tidal on the Earth Surface; Case study: Iran

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Abstract

The gravitational force due to the sea level rise causes secondary changes in the Earth's surface that are approximately a few centimeters. Although, these variations are negligible comparing to the direct tidal effects, regarding the precise satellite earth positioning methods (with a few millimeters accuracy) such as Global Positioning System (GPS), and Very Long Base Line Interferometry (VLBI), applying the above corrections in data processing is essential.

In this paper, using a global ocean tidal model, in our case TPX0.6.2, the magnitude of the secondary effects for ten major tidal components including $M_f, M_m, K_1, O_1, P_1, Q_1, M_2, S_2, N_2, K_2$ had been computed on the Earth's surface in Iran. The results indicated that the greatest amount of the secondary effects which is related to the M_2 tidal component on the Oman Sea can reach to about 2.3 cm.

Keywords: *Ocean tide, Love numbers, Tide gauge, Satellite altimetry, Spherical harmonics.*
