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Assessment of the Correlation between Crust and its Estimated Elastic Layer Thickness in Iran

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Abstract:
Although crust plates movements are usually just under few centimeters during a year, it can deform elastic layer of rocks on the faults and, as a result, energy stores in the layer. Sometimes, just in a few seconds, the accumulated energy within the layer releases suddenly and an earthquake occur. The effective elastic thickness of lithosphere has a prominent role to predict the focal depth of earthquakes and their magnitude, as well. Since lithosphere is flexed by the mass of topography on the earth's surface, the spectral analysis of topography and gravity anomaly is an appropriate method to assess the flexure of lithosphere and estimate its elastic layer thickness.
In this paper, by spectral analysis of free-air gravity anomaly and topography signals which were generated respectively from EIGEN-GL04C and ETOPO5 global models; elastic layer thickness in different regions of Iran are calculated. Comparing the crust thickness (obtained from CRUST2.0 model) and the estimated elastic layer thickness, a statistically significant correlation between the two parameters could be seen.