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Spectral analysis of Caspian Sea level change, using TOPEX/Poseidon mission data

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Abstract

The aim of this paper is to evaluate temporal variation of the Caspian Sea level by using satellite altimetry data gathered by TOPEX/Poseidon (T/P) mission. The average water level variation of the Caspian Sea is rather complicated and non-periodic. Long-term record indicates that the average level has varied considerably during the last years (which is mostly affected by many factors such as global warming, changing in water inflow rates to the Caspian Sea because of the changes in agriculture policies by neighboring countries and other climate changes.). Review of various approximation methods employed by researchers shows a wide range of differences. Some authors predict the sea level rises from -22.00 to -18.00 m (in respect to Chart Datum, C.D.) in the first half of 21th century while others forecast it falls from -34.00 to -28.00 m. This wide range of forecasted water level in one hand and its importance to development and economy of the surrounding countries in the other hand motivate us to analyze this problem from different perspectives. This research aims to use spectral analysis to find significant frequencies and mean value of sea level and temporal variation of them. During this analysis we use 350 cycles of T/P data to evaluate the parameters.
Key words. Caspian Sea, Topex/Poseidon,Sea level, Spectral analysis