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Regional Patterns of Sea Level Trends and Tidal Model in The Southwestern Coast of Turkey

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At present, the tide gauges and the satellite altimetry are important two main techniques for monitoring sea level trends and for determining the tidal constituents. The Tide gauges measure sea level relative to a ground benchmark as a datum, therefore, their observations are affected by local vertical ground motions. Satellite altimetry measures sea level relative to a geocentric reference and not affected by vertical land motions.

Moreover, the tidal constituents are an important parameter for making a better evaluation of variations in the sea level due to meteorological causes. In this study, we are aimed to investigate how the tides constituents affect determining of the sea level trends.

The linear relative sea level trends of 6 tide gauge stations distributed in the southwestern coast of Turkey have been computed over the period 1998 – 2018. The tide gauge data were obtained from TUDES (Turkish National Sea Level Monitoring System) data archive and satellite altimetry data were obtained from AVISO data archive.

The sea level data have been analyzed and compared to the tides affect sea level based on the tidal model by using the tide gauge station and satellite altimetry data sets. The tidal model belonging to each year between 2004 and 2018 is analyzed to compare the model of different years and methods and the tidal parameters and their standard deviation determined for each year. For each year, the tidal model is created and compared previous studies and global model such as FES2004.

Keywords: Tidal Constituents, Sea Level, Satellite Altimetry, Tide Gauge, Time Series