



New approach for measuring Mean Sea level using Acoustics waves to complete recent methods

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Abstract: For monitoring sea instantaneously height, some methods exist, for examples Tide gage satellite altimetry and etc. In this paper we present new approach that can be used for completing the upper methods. Base in our methods is use of acoustics waves that containing transponder (at seafloor) and transducer (at sea surface). This system consists of two main components; (1) the surface positioning by differential GPS to on-land reference and (2) the precise acoustic ranging using the M-sequence between the surface and seafloor references. The position and attitude of the surface GPS-acoustic link unit are determined from the GPS observations. Simultaneously, the acoustic ranging between the surface unit and seafloor references are carried out. The positions of the seafloor references are determined from these observations and a sound-speed structure model of the seawater. Surface transmitter is settling on buoys that their rotation and position measuring instruments include GPS antenna and motion sensor and etc. Calculate of horizontal component is not significant in this paper because studying tide needs vertical component and displacement. For calculating tide we should establish time series between time and vertical displacement. The ranges between the seafloor and surface are measured using the acoustic ranging technique. With measured ranging at deferent times we can form time series between vertical displacement and time, in order to we can monitoring the displacement of Mean Sea Level.

Key words: MSL, Acoustics waves, GPS, Transducer, Transponder