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Tidal sea level oscillations in the Sea of Azov

Arina Korzhenovskaia^{1,2}, Igor Medvedev¹, and Viktor Arkhipkin²

¹Shirshov Institute of Oceanology, Russian Federation (a79198153474@yandex.ru)

²Lomonosov Moscow State University, Russian Federation

The Sea of Azov is the most isolated and shallow sea of the World Ocean. Longterm hourly data from 14 coastal tide gauges were used to study the features of tides in the Sea of Azov. Spectral analysis showed well-defined spectral peaks at tidal diurnal and semidiurnal frequencies. Harmonic analysis of tides for individual annual sea level series with consecutive vector averaging over the entire observation period was applied to estimate mean amplitudes and phases of 11 tidal constituents. The amplitude of the major diurnal harmonics is generally greater than the semidiurnal ones. The amplitude of the diurnal radiational constituent S_1 changes from 6 cm at the head of the Taganrog Bay to 0.5 cm in the Kerch Strait, while the amplitude of the main semidiurnal gravitational harmonic M_2 inside the sea varies from 1.0 cm in the southeastern part of the Sea of Azov, to 0.38 cm at Mysovoye. The tidal form factor within the Sea of Azov changes significantly from the diurnal form in the north to the mixed, mainly semidiurnal near the Kerch Strait. The maximum theoretical tidal range of 19.5 cm were found at the head of the Taganrog Bay, and the lowest was noted in the Kerch Strait, 4.9 cm. The assumption about the predominantly radiational genesis of diurnal tides is confirmed by the seasonal variations of their spectrum. Radiational tides in the Sea of Azov may be initiated by sea breeze winds, which is best expressed in summer.