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Simulation of tides in z- and σ -models of marine circulation in the Sea of Okhotsk /

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The study considers the reproduction of tides by two marine circulation models implemented for the Sea of Okhotsk: the z-model with a spatial resolution of ~3.7 km implemented directly for the Sea of Okhotsk, and the σ -model with a spatial resolution of ~3.5 km implemented for the Sea of Okhotsk and the Sea of Japan. The z-model is based on the HyRMoS (Hydrometcenter of Russia Model of Sea) model developed by S. K. Popov at the Hydrometeorological Center of Russia, the σ -model is based on the INMOM (Institute of Numerical Mathematics Ocean Model).

The results of model simulations were compared with the data of harmonic constants of the main tidal harmonics presented at 98 coastal stations located in the Sea of Okhotsk and the Tatar Strait. An analysis of the calculation results showed that the accuracy scores are comparable for both models. The difference in the values of tidal harmonics revealed in the study and obtained from the z-and σ -models is primarily due to the accuracy and features of the bottom topography used and is also related to the location of the open boundaries and the configuration of the grid domains.

Keywords: tides, numerical modeling, z-model, σ -model, the Sea of Okhotsk

Tab. 1. Fig. 7. Ref. 19.