



Prognostic characteristics of the lowest-mode internal waves in the Sea of Okhotsk

Andrey Kurkin (1), Oxana Kurkina (1), Andrey Zaytsev (2,1), Artem Rybin (1), Tatiana Talipova (1,3)

(1) Nizhny Novgorod State Technical University n.a. R.E. Alekseev, Department of Applied Mathematics, Nizhny Novgorod, Russian Federation (aakurkin@gmail.com), (2) Special Research Bureau for Automation of Marine Researches, Far Eastern Branch of Russian Academy of Sciences, (3) Institute of Applied Physics, Department of Nonlinear Geophysical Processes, Nizhny Novgorod, Russian Federation

The nonlinear dynamics of short-period internal waves on ocean shelves is well described by generalized nonlinear evolutionary models of Korteweg - de Vries type. Parameters of these models such as long wave propagation speed, nonlinear and dispersive coefficients can be calculated using hydrological data (sea water density stratification), and therefore have geographical and seasonal variations. The internal wave parameters for the basin of the Sea of Okhotsk are computed on a base of recent version of hydrological data source GDEM V3.0. Geographical and seasonal variability of internal wave characteristics is investigated. It is shown that annually or seasonally averaged data can be used for linear parameters. The nonlinear parameters are more sensitive to temporal averaging of hydrological data and detailed data are preferable to use. The zones for nonlinear parameters to change their signs (so-called “turning points”) are selected. Possible internal waveforms appearing in the process of internal tide transformation including the solitary waves changing polarities are simulated for the hydrological conditions in the Sea of Okhotsk shelf to demonstrate different scenarios of internal wave adjustment, transformation, refraction and cylindrical divergence.