Geophysical Research Abstracts
Vol. 13, EGU2011-4363, 2011
EGU General Assembly 2011
© Author(s) 2011

Nonlinear dynamics of intensive internal waves in bounded stratified basins

Ekaterina Ruvinskaya (1,2), Oxana Kurkina (3,4), Andrey Kurkin (1), Alexey Kuzin (1), and Michail Barenboim (1)

(1) Nizhny Novgorod State Technical University, Institute of radio engineering and information technologies, Applied Mathematics, Nizhny Novgorod, Russian Federation (moonlights87@mail.ru), (2) Institute of Applied Physics, Nizhny Novgorod, Russia , (3) Institute of Cybernetics, Tallinn University of Technology, Tallinn, Estonia, (4) State University The Higher School of Economics, Nizhny Novgorod Branch, Nizhny Novgorod, Russia

The nonlinear-dispersive-dissipative dynamics of internal disturbances of large amplitude in closed basins (lakes, bays) with variable bottom is studied in the framework of the Euler equations of incompressible stratified fluid. The results of numerical simulation of initial and boundary problems are presented. Nonlinear waveforms, which can be excited by harmonic force in resonator system or as a result of initial disturbance evolution, are given. Internal solitons of different vertical modes can be generated against the background of a largescale standing mode. The parameter planes showing different regimes of wave dynamics are presented for different parameter pairs. The applicability of possible simplified models is discussed.

Authors received funding from the RF special-purpose program “Scientific and scientific-pedagogical cadres of innovative Russia" for 2009 – 2013 (activity 1.2.1), they acknowledge as well RFBR grant 10-05-00199 and RF President grant for young researchers MD-99.2010.5.