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Modeling of the internal solibore evolution

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Numerical modeling of dispersive shock waves called solibore in a stratified fluid is conducted. The theoretical model is based on the extended version of the Korteweg-de Vries equation which takes into account the effects of cubic nonlinearity, dissipation in near-bottom turbulent layer and Earth rotation. This model is now very popular in the physical oceanography. Initial conditions for simulations correspond to the real internal waves of shock-like shape in the Pechora Sea (south-eastern part of Barents Sea), the Arctic observed in 1998. The density stratification of this area is not well known and we study the sensitivity of our numerical results to density profile approximation. It is shown that although the wave kinematic parameters are sensitive for these factors nevertheless a sharp drop (like kink in the soliton theory) in the depth of the thermocline is conserved at a distance of one–three kilometers, and then it is transformed into dispersive shock waves (solibore).