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Dynamics of nonlinear interfacial solitary waves in a basin of variable depth

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Propagation of internal solitons of moderate amplitude in the two-layer ocean of variable depth is studied in the framework of the moderate nonlinear Gardner and fully nonlinear Euler equations. The analytical solution for soliton amplitude is obtained with the use of asymptotic expansions in the small parameter: the slope of the bottom. The theoretical results are compared with the numerical ones. The possibility of conservation of the soliton shape as it propagates is discussed. It was found that with an increase in the initial amplitude, the pulse faster deviates from the soliton shape.