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# Numerical solution of variational data assimilation problem for 3D ocean model with 1D nonlinear vertical heat exchange

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We consider the variational data assimilation problem to identify the initial condition for temperature in 3D ocean model by using 1D module of vertical heat exchange governed by a non-stationary heat equation with nonlinear diffusion. We give the operator formulation of the problem and present solvability results. Numerical algorithms are developed for solving the data assimilation problem. The 1D assimilation module is incorporated with the full 3D ocean model developed at the Institute of Numerical Mathematics. Numerical results are presented for the Indian ocean, which show that the developed techniques can be used in order to identify or correct some functions in full 3D ocean model.