Variational data assimilation problem for the Baltic Sea thermodynamics

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The most versatile and promising technology for solving problems of monitoring and analysis of the natural environment is a four-dimensional variational data assimilation of observation data. In such problems not only the development and justification of algorithms for numerical solution of variational data assimilation problems but the properties of the optimal solution play an important role.

In this work the variational data assimilation problems in the Baltic Sea water area were formulated and studied. Numerical experiments on restoring the ocean heat flux and obtaining solution of the system (temperature, salinity, velocity, and sea surface height) in the Baltic Sea primitive equation hydrodynamics model with assimilation procedure were carried out. In the calculations we used daily sea surface temperature observation from Danish meteorological Institute, prepared on the basis of measurements of the radiometer (AVHRR, AATSR and AMSRE) and spectroradiometer (SEVIRI and MODIS). The spatial resolution of the model grid with respect to the horizontal variables amounted to 0.0625x0.03125 degree. The results of the numerical experiments are presented.

References:

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