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# Global ocean simulation with INM-IO eddy-resolving model

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An eddy-resolving numerical ocean model is used to study intra- and inter-annual variability of the World Ocean. In study we use z-coordinate global ocean circulation model with 1/10 degree horizontal resolution and 49 vertical levels. The model is based on the system of three-dimensional primitive equations of ocean dynamics. A numerical method is based on the separation of solutions to barotropic and baroclinic components. The ocean model is coupled with sea ice and atmospheric boundary layer submodels. The model was developed at the Institute of Numerical Mathematics (INM RAS) and P.P.Shirshov Institute of Oceanology of the Russian Academy of Sciences (IO RAS).

In the first set of numerical simulations atmospheric conditions defined by the normal annual cycle, in accordance with the terms of the international experiment CORE-I (Coordinated Ocean-ice Reference Experiment) was used. Results of these simulations were used to present and analyze intra-annual variability in the oceans.

The second set of numerical simulations was forced with ERA-40 data. Eddy-resolving global model simulations were used not only to study large-scale circulation. Regional processes were also estimated and discussed. For instance model solution demonstrates considerable variability of the flow with the formation of strong anticyclonic meanders along the Japanese islands. Structure of the meridional circulation is consistent with results obtained by other global models and models of the Atlantic Ocean. Dynamics of the Gulf Stream and Kuroshio current in numerical solution quite accurately match with satellite altimetry data.