Coupled model of INM-IO global ocean model, CICE sea ice model and SCM OIAS framework

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Status of coupled Arctic model of ocean and sea ice is presented. Model consists of INM IO global ocean component of high resolution, Los Alamos National Laboratory CICE sea ice model and a framework SCM OIAS for the ocean-ice-atmosphere-land coupled modeling on massively-parallel architectures. Model is currently under development at the Institute of Numerical Mathematics (INM), Hydrometeorological Center (HMC) and P.P. Shirshov Institute of Oceanology (IO). Model is aimed at modeling of intra-annual variability of hydrodynamics in Arctic and.

The computational characteristics of the world ocean-sea ice coupled model governed by SCM OIAS are presented. The model is parallelized using MPI technologies and currently can use efficiently up to 5000 cores. Details of programming implementation, computational configuration and physical phenomena parametrization are analyzed in terms of intercoupling complex. Results of five year computational experiment of sea ice, snow and ocean state evolution in Arctic region on tripole grid with horizontal resolution of 3-5 kilometers, closed by atmospheric forcing field from repeating "normal" annual course taken from CORE1 experiment data base are presented and analyzed in terms of the state of vorticity and warm Atlantic water expansion.