



## **A Global Ocean Circulation Model based on a Mimetic Discretization Approach**

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The new general circulation model of the global ocean ICON-O is introduced. ICON-O based on the Ocean Primitive Equations: the incompressible Navier-Stokes Equations in vector invariant form with a free surface plus the hydrostatic and the Boussinesq approximation. The model solves the ocean primitive equations on a triangular icosahedral grid with C-type staggering. The models dynamical core as well as its parametrizations such as the mesoscale eddy parametrization of Gent-McWilliams use a coherent discretization that is based on a mimetic discretization approach. We describe the new discretization and some of its properties. A sequence of simulations is presented that range from idealized process studies to long-term global ocean simulations.

The Max Planck Institute for Meteorology and the German Weather Service have been collaborating through the ICON project to develop new coupled atmosphere-ocean general circulation models for climate research and numerical weather forecasting. The model ICON-O is the ocean component of the ICON modeling system.