Contribution ID: **17** Type: **Talk**

The Finite volumE Sea ice-Ocean Model (FESOM 2.0): progress, features and performance

Tuesday 28 January 2020 09:30 (30 minutes)

We will present the evaluation of the second version of the unstructured-mesh Finite-volumE Sea ice–Ocean circulation Model (FESOM2.0), with respect to the sensitivity to arbitrary Lagrangian Eulerian (ALE) linear and nonlinear free surface formulation. Further, the hydrographic biases, large scale circulation, numerical performance and scalability of FESOM2.0 are compared with its predecessor version FESOM1.4. Compared to its predecessor, FESOM2.0 shows hydroghraphic biases with a similar magnitude but with a more realistic representation of the Atlantic Meridional Overturning Circulation (AMOC). FESOM2.0 provides clearly defined fluxes and a three times higher throughput in terms of simulated years per day (SYPD) than its predecessor, which makes FESOM2.0 to the first mature global unstructured-mesh ocean model with computational efficiency comparable to state-of-the-art structured-mesh ocean models.
Mixing across density surfaces is an essential part of the thermohaline circulation and can control the ocean circulation, the global heat budget or the distribution of nutrients in the ocean. Recently the vertical mixing library CVMIX and the novel energy consistent vertical Turbulent-Kinetic-Energy (TKE) mixing parameterisation in combination with the Internal Wave Dissipation, Energy and Mixing (IDEMIX) got implemented into FESOM2.0. We will show first results regarding the hydrographic biases of the different vertical mixing parameterisations within FESOM2.0.

Do you need an official invitation letter?

No

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Track Classification: COMMODORE conference