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Sensitivity of subpolar boundary currents to ocean model parameters

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The path, transport and stability properties of the boundary currents simulated by the global 1/4° DRAKKAR ocean/sea-ice model is highly sensitive to the choice of a momentum advection scheme, lateral boundary condition , and numerical representation of topography. Process-oriented numerical simulations are performed with the OPA9 ocean model to determine how the properties (continuity, stability, transport, scales) of a subpolar boundary current flowing along the Greenland shelf depend on the numerical parameters mentioned above, model vertical coordinate, horizontal and vertical resolution, and on physical parameters (flow intensity and baroclinic structure, topographic slope). These idealized simulations explain a significant part of the sensitivity observed in the global configuration, and will help improve the parameterization of current-topography interactions.