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# Recent developments of finite-element circulation model

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The finite-element general ocean circulation model of AWI is successfully used in applications to the North Atlantic, the Southern Ocean (with finite-element ice model) and on the global scale. We present a modified version of the model with a new dynamical core based on nonconforming linear elements for velocity and prismatic spatial discretization. Although the number of degrees of freedom of the velocity field in this setup increases, the setup is free of pressure modes and thus does not need stabilization. A Taylor-Galerkin advection scheme was tested with this version and found to be superior in terms of accuracy and CPU time requirements than previous version using the Galerkin least-squares stabilization. The model performance is illustrated with several examples.