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Modelling of the North Atlantic eddy characteristics

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We investigate eddy characteristics of the Atlantic basin circulation and their impact on the ocean heat transport. A 15-year-long numerical experiment is performed with the global 3-dimensional z-coordinate INMIO ocean general circulation model of 0.1 deg., 49 levels resolution in conditions of the CORE-II protocol. The model is tuned to maximal intensity of eddies production by using only biharmonic filters instead of lateral viscous and diffusive terms in the model equations. Comparison with viscous and coarse-resolution simulations shows the increase of explicitly resolved heat transfer fraction and absolute values. Vertical turbulent mixing is parameterized by the Munk-Anderson scheme including convective adjustment. The sea ice is described by a simple thermodynamic submodel.
The eddying velocity and temperature field components are defined as anomalies relative to the 3-month sliding mean. The regional distributions of hydrological parameters, eddy kinetic energy, heat convergence, meridional heat transport (MHT) and Atlantic meridional overturning circulation (AMOC) streamfunction, and their temporal variability are analyzed. In some parts of the basin the simulated eddy heat transport is opposite to the mean flow transport and may change direction with depth. The MHT intensity is slightly below observationally based assessments with notable influence of the East Greenland current simulation bias.
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