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An Eulerian Iceberg Module for Climate Studies in the Max Planck Institute Ocean Model

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Iceberg studies are of great interest for understanding how fresh water is transported and distributed in the ocean, as water release plays an important role in ocean heat transfer and Atlantic meridional overturning circulation (AMOC). Main processes after the calving of an iceberg are the drift and change in size due to deterioration. The classical way of implementing icebergs is based on Lagrangian approach, which treats each iceberg as an individual particle and allows to calculate the trajectory and mass loss of standalone iceberg. Here we present an iceberg module in the Eulerian coordinate system integrated into the Max Planck Institute Ocean Model (MPIOM). This approach allows describing the iceberg's evolution within the MPIOM infrastructure, which simplifies the parallelization and reduces computation time. The latter is an advantage for long-term simulations, such as the last deglaciation, which is associated with large icebergs discharge events, the so-called Heinrich events. The Eulerian iceberg module uses the same parametrizations of drift and deterioration as the Lagrangian module but with modifications corresponding to the Eulerian representation of motion. Here we present first results of the integrated Eulerian iceberg module into the MPIOM.