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Coupled FESOM/ECHAM5 setup, strategies and solutions

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We describe the global configuration of a coupled atmosphere/ocean model. The atmosphere is simulated by the ECHAM5 and the ocean by the Finite-Element Sea-Ice Ocean Model (FESOM), which supports unstructured meshes and allows for variable resolution. Coupling between structured and unstructured meshes is a technically challenging task due to different geometry, resolution and representation of coastlines in both components. This has been achieved via the parallel OASIS4 coupler and additional use of a regular exchange mesh. The latter has been introduced in the ocean model. The conservation of flux moments requires additional care since model grids are different in both components. The heat and moisture fluxes are computed in the atmospheric model so that the flux variance is defined by the resolution in the atmosphere. Since it is problematic to downscale the variance onto the fine resolved parts of the ocean, a few interpolation techniques are suggested. We validate the coupled setup on the basis of an integration run for 300 years.