300 year simulation with the coupled FESOM/ECHAM5 model

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We present a global climate model setup where the Finite-Element Sea-Ice Ocean Model (FESOM) has been coupled to the atmospheric model ECHAM5. The major difference of this setup to other climate models is the ocean component which supports variable resolution. The latter allows to refine the areas of particular interest in the global context and to resolve narrow straits where it is needed. Current model setup has a resolution varying from 30 to 200 km in the ocean and T63L31 ($\sim$1.8°) configuration in the atmosphere. We present 300 year integration results, discuss model variability and trends. It is shown that the climate state simulated by FESOM/ECHAM is in most cases within the spread of other models.

On another hand we address the technical complexity of this setup, linked to an exchange between un-structured and structured meshes. These have different geometry, representation of coastlines and different rules for the flux definition. This implies that additional strategies have to be developed in order to preserve the flux conservation. We summarize the problems and suggest our compromised solutions.