



## **The chemistry climate model EMMAC (ECHAM5-MPIOM/MESSy Atmospheric Chemistry)**

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A new coupling method has been developed and implemented between the ECHAM5 atmospheric general circulation model and the MPIOM ocean general circulation model, creating the EMMAC (ECHAM5-MPIOM/MESSy Atmospheric Chemistry) chemistry climate model.

The coupling is based on the MESSy (Modular Earth Submodel System) interface and has been tested for different configurations, proving to be very flexible in terms of the parallel decomposition and highly balanced in terms of CPU load.

It is shown that the MESSy based coupling results in a model speedup of  $\sim 10\%$  compared to the coupling based on the OASIS (Ocean Atmosphere Sea Ice Soil) coupler.

Model results from long-term simulations are analysed, showing that the EMMAC results are consistent with those that have been obtained calculated by a series of climate models presented in the IPCC 4th assessment report. The presented model simulations are based on constant pre-industrial and contemporary greenhouse gases (GHG) concentrations, as well as transient (1850-2000) GHG concentrations.