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The Atmosphere–Ocean General Circulation Model EMAC–MPIOM

A. Pozzer et al. ▾

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Abstract. The ECHAM/MESSy Atmospheric Chemistry (EMAC) model is coupled to the ocean general circulation model MPIOM using the Modular Earth Submodel System (MESSy) interface. MPIOM is operated as a MESSy submodel, thus the need of an external coupler is avoided. The coupling method is tested for different model configurations, proving to be very flexible in terms of parallel decomposition and very well load balanced. The run-time performance analysis and the simulation results are compared to those of the COSMOS (Community earth System MOdelS) climate model, using the same configurations for the atmosphere and the ocean in both model systems. It is shown that our coupling method shows a comparable run-time performance to the coupling based on the OASIS (Ocean Atmosphere Sea Ice Soil, version 3) coupler. The standard (CMIP3) climate model simulations performed with EMAC–MPIOM show that the results are comparable to those of other Atmosphere–Ocean General Circulation models.

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