A technique to study coupled ocean-atmosphere climate variabilityA technique to study coupled ocean-atmosphere climate variability

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Research based on high-resolution satellite data and model experiments indicates that the mid-latitude ocean might exert a stronger influence on the large-scale atmospheric circulation than previously thought. Here we introduce an interactive ensemble technique for enhancing coupled ocean-atmosphere interaction in standard resolution climate models. This technique can be useful for improving understanding of climate dynamics and for improving climate prediction. We will present some initial results using the CMIP5 version of the MPIESM in a configuration for studying Atlantic climate variability. In particular, we have coupled five identical versions of the ECHAM6 atmospheric model to a single version of the MPIOM ocean model. At each coupling time step, MPIOM is driven every five consecutive days by atmospheric fluxes from one of the ECHAM6 realisations selected at random in the Atlantic sector, and elsewhere MPIOM is driven by fluxes from the same ECHAM6 realisations. All ECHAM6 models are driven by the identical ocean condition. This enhances coupled ocean-atmospheric variability in the Atlantic Sector, by suppressing the contribution of atmospheric variability unrelated to Atlantic Ocean conditions. We have completed 100 years of simulation and are currently extending the simulation.

Keywords: Interactive ensemble, Climate prediction, Atlantic Multi-decadal Variability

