

Interactive comment on “Simulation Improvements of ECHAM5-NEMO3.6 and ECHAM6-NEMO3.6 Coupled Models Compared to MPI-ESM and the Corresponding Physical Mechanisms” by Shu Gui et al.

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Dear Prof. Wang:

Thank you very for your post. It is certainly possible that the NEMO3.6 is more suitable for ECHAM5.4, even though the surface flux biases are larger than those of the ECHAM6.3 in the coupled experiment. However, the SST simulation doesn't all depends on the OGCM. It has been confirmed that the OGCM does not exhibit excessive cold tongue bias in the standalone historical runs. Apart from other studies that probe

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into the SST variations with different coupling systems, our test results also suggest that the air-sea interaction reshape the bias pattern to a large extent. We have tested the standalone NEMO performance with historical input files and the SST bias becomes much smaller in tropical areas, but significant cold SST biases appear in the North Pacific and North Atlantic, similar to that of the ECHAM6-NEMO3.6 (See the following figure). It serves as an evidence to prove that air-sea coupling with substantial amount of heat, momentum, and condensation fluxes can redirect the model performance to a new equilibrium state that can be out of the original perspective.

Sincerely,

Shu Gui and coauthors

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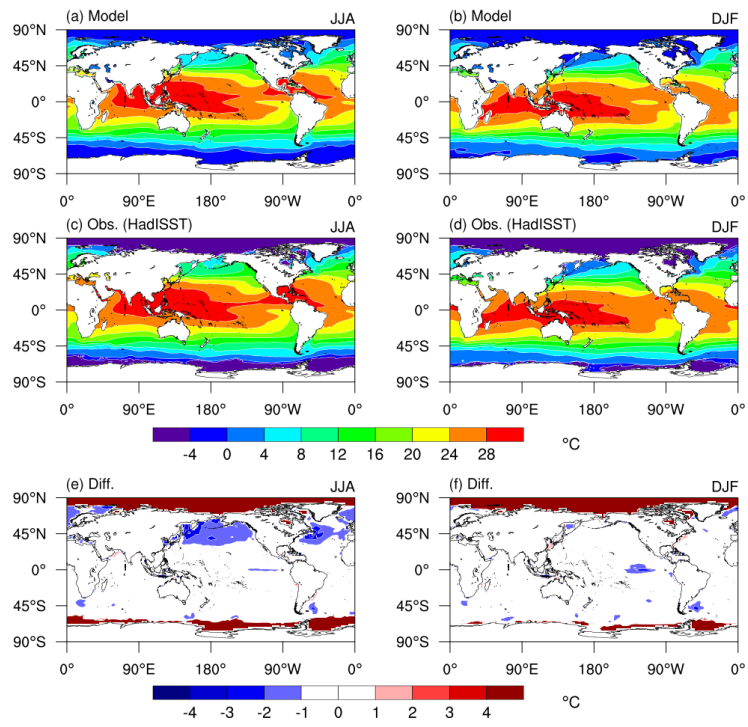


Fig. 1.