

A New Approach to Reproduce 20th Century ENSO Variability in an OAGCM

Mathieu JOLY

([mathieu.joly at meteo.fr](mailto:mathieu.joly@meteo.fr))

Météo-France, CNRM/GMGEC/UDC, 31057 Toulouse. France

A new approach to reproduce the observed variability in ocean-atmosphere coupled simulations is tested. The method is based on the use of a reanalyzed wind-stress to drive the ocean, while keeping all other fluxes fully coupled. Two designs have been tested: one in which the wind-stress is forced everywhere, and one in which the wind-stress is only forced over the tropical Pacific.

The main result is that forcing the wind-stress is sufficient to reproduce quite accurately the observed 1960-2001 ENSO timing. However, in the details, the simulated ENSO pattern is characteristic of the coupled model, without the diversity of observed ENSO anomalies.

The idea of such experiments is similar to the "pacemaker" protocol. Thanks to the realistically simulated ENSO timing it is now possible to make year-to-year comparisons between simulations and observations. Besides, forcing the wind-stress saves the heat budget at the ocean surface, and partially preserves the ocean-atmosphere interactions, which is not the case in "pacemaker" experiments.

Finally, the simulations are analyzed in terms of teleconnections between the ENSO and the West African monsoon. It is shown that teleconnection mechanisms are quite different in our model than in the observations.