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# Predictability of ENSO and IOD and their global teleconnections

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Dynamical climate predictions on seasonal to interannual scales have become reliable recently because of advances in ocean-atmosphere coupled general circulation models (CGCMs) and introduction of high performance computing systems. Using the giant Earth Simulator, we have developed SINTEX-F1 CGCM at JAMSTEC under the EU-Japan collaborative framework. For the retrospective and real-time forecasts, a semi-multi-model ensemble system is introduced by varying model coupling and initial conditions; satellite-observed SSTs are assimilated into the model to produce a simple ocean initial condition. The retrospective forecasts have demonstrated model's excellent skill in the prediction of El Nino/Southern Oscillation (ENSO), Indian Ocean Dipole (IOD) and their global teleconnections. Particularly, the model has shown reliable skills for ENSO forecasts at a lead-time of 2 years. This has encouraged several climate applications projects for the management of agriculture and infectious diseases.

Besides these successes, the model has shown some prediction biases, common to several other leading prediction models of the world particularly for the climate variations in eastern tropical Atlantic Ocean. Possible causes of these biases are evaluated by intercomparing the SINTEX-F model results with some other available prediction model results. Interestingly, based on a few model sensitivity experiments, it is found that the inter-basin interactions between Indian and Pacific Oceans do affect the predictability of ENSO and IOD. The teleconnections of ENSO and IOD to the extratropical climate variations, e.g. the summer monsoon rainfall over India and East Asia, are also sometimes affected by prediction biases. A common issue found in most of these models is the locations of tropical convections, which affect the corresponding teleconnections.