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# Recent progress in the MIROC5 seasonal prediction system and predictability of two flavors of El Nino

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This study investigates the difference of the seasonal predictability for two prominent types of El Nino, traditional eastern Pacific (EP) events and central Pacific (CP) events.

We developed a seasonal prediction system using the coupled atmosphere-ocean general circulation model (AOGCM) MIROC5 co-developed by Atmosphere and Ocean Research Institute (AORI), National Institute for Environmental Studies (NIES), and Japan Agency for Marine-Earth Science and Technology (JAMSTEC). The spatial resolution is a horizontal triangular spectral truncation at total wave number 85 (T85) with 40 vertical layers, and eight ensemble forecast members are generated according to the protocol of the WCRP Climate-system Historical Forecast Project (CHFP). Hindcast products for the period 1979-2011 show high predictability of tropical climate signals with the significant anomaly correlation coefficient skill scores, even though the ocean anomaly data assimilation is applied to the initialization process. The monsoon and Indian Ocean Dipole (IOD) indices also show predictable signals until a few months later. Interestingly, our seasonal prediction system is less affected by the ”spring prediction barrier” compared to most of the other AOGCMs.

We assess the difference of the seasonal predictability for two prominent types of El Nino, traditional EP events and recent CP events. Overall, the predictable months of CP events are shorter than EP events because CP events have less amplitude and are sensitive to atmospheric noises. It seems that this difference in predictability connects to the recent low predictability after 2000 as shown in Barnston et al. (2012). Characteristics of each error-growing process are also investigated.

Barnston, A. G., M. K. Tippett, L. L’Heureux, S. Li, and D. G. DeWitt (2012), Skill of real-time seasonal ENSO model predictions during 2002-11, BAMS, 631-651.

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