

# **Seasonal Prediction of the East Asian Winter Monsoon and Its Decadal Change**

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This study examines seasonal prediction of the East Asian Winter Monsoon (EAWM) and its decadal change after mid-1990s. Dynamical and statistical seasonal prediction skills of the EAWM are assessed using state-of-the-art dynamical ensemble prediction systems (EPSs): CanCM3, CanCM4, CFSv2, CM2.1, and GEOS-5, which are affiliated in the North American multi-model ensemble (NMME).

Most of prediction systems show poor prediction skill of the EAWM after 1-month lead. CFSv2 and GEOS-5 shows extended prediction skill during the recent period (1997–2010) than that of the earlier period (1983–1996). In the recent period, the tropical western Pacific shows a decadal warming and intensified precipitation trend. From those strong tropical convective forcing, the EAWM also shows strengthened relationship with ENSO in recent period. Prediction systems with representing the recent intensified relationship show more useful prediction skill than the others. These results imply recent intense teleconnection between the tropics and East Asia is possibly associated with prediction skill of the EAWM. In this regard, there are untapped predictability source in the tropical western Pacific which can improve seasonal prediction of the EAWM.

From these aspects, dynamical-statistical hybrid prediction of the EAWM index is also assessed using predictors located in the tropics, which are predicted by dynamical seasonal prediction. The hybrid prediction with shows obvious improvement of the skill only during the recent period than that of dynamical prediction.

Key words: East Asian Winter Monsoon, hybrid prediction, ENSO teleconnection, decadal regime shift