The Southern Annular Mode (SAM) is the dominant mode of variability of the extratropical atmospheric circulation in the Southern Hemisphere at timescales longer than ~1 week. Its variability explains ~30% of the total variance of the circulation over the SH extratropics. SAM is understood to be driven by internal atmospheric dynamics, reflected in its relatively short decorrelation time (~10 days). This short decorrelation time suggests that predictability of the SAM at long lead time might be limited, especially in a forecast model with poor stratospheric resolution. Nonetheless, we demonstrate that variability of the SAM can be predicted with good skill (e.g., proportion of correct forecasts of below/above average > 60%, correlation of forecast and observed SAM > 0.4) at short lead times of 0-1 month by the Australian Bureau of Meteorology's coupled dynamical seasonal prediction system, POAMA.

In order to understand the source of the prediction skill, we have conducted modelling experiments by altering atmosphere and ocean initial conditions in the forecast system and by forcing the atmospheric model with observed and forecast sea surface temperatures. The results suggest that the prediction skill of monthly-seasonal time-scale SAM stems from realistic atmosphere and ocean initial conditions and teleconnection between ENSO and SAM during austral late spring to summer. Improved stratospheric resolution and initial conditions should extend the lead time for skillful prediction.