



## **Linking the North American dipole to the Pacific meridional mode**

Ruiqiang Ding

Institute of Atmospheric Physics, Chinese Academy of Sciences (drq@mail.iap.ac.cn)

The North American dipole (NAD) represents a meridional dipole of sea level pressure (SLP) anomalies over the western tropical North Atlantic and northeastern North America. This study demonstrates that the NAD is intimately linked to the development of the Pacific meridional mode (PMM). In addition to the North Pacific Oscillation (NPO), the NAD provides another important external forcing source to trigger the PMM. The NAD influences the PMM through both direct and indirect pathways. The direct effect is that the winter NAD influences the sea surface temperature (SST) and surface winds over the northeastern subtropical Pacific (NESP) through concurrent anticyclonic flow associated with the NAD, which tends to generate a weak initial warming over the NESP region during late winter and early spring. The indirect effect is that the NAD first induces SST cooling over the northern tropical Atlantic (NTA) during spring, and the NTA SST cooling then generates a low-level anticyclonic flow anomaly over the NESP, which further strengthens the surface warming over the NESP, thereby causing the development of the PMM in the following months. The NAD can also exert an influence on the El Niño-Southern Oscillation (ENSO) through its effects on the PMM. In particular, El Niño episodes led by the combined NAD-PMM events tend to take the form of the Central Pacific El Niño, rather than the canonical eastern Pacific El Niño. We suggest that a better understanding of the NAD-PMM-ENSO dynamic link could be useful for the prediction of different types of El Niño event.