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The interdecadal change of wintertime climate over East Asia

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The interdecadal change of the relationship between the winter mean surface air temperature (SAT) over East Asia (EA) and El Niño-Southern Oscillation (ENSO) is investigated using both observational data and a simple general circulation model. A positive phase of the first empirical orthogonal function (EOF) mode of the SAT (SAT-EOF1) over EA is characterized by significant warming over the mid- to high-latitude EA and is linked to the Arctic Oscillation (AO). The second EOF mode (SAT-EOF2) is represented by a significant cooling extending from 55° N to the tropics and an abnormal warming over the high-latitude EA. Focus is given to SAT-EOF2 which has a close relationship to a La Niña type sea surface temperature (SST) anomalies. A clear climate shift of SAT-EOF2 is observed in the mid-1980s. The relationship between SAT-EOF2 and ENSO in two subperiods, i.e., 1957 to 1982 (P1) and 1986 to 2010 (P2), are discussed and compared. Results showed that the relationship between SAT-EOF2 and ENSO is significantly increased after mid-1980s. This is due to stronger SST and precipitation anomalies in the tropical western Pacific associated with ENSO in P2 than in P1. In the mid-latitudes, the Pacific-North American (PNA) teleconnection pattern is more closely related to ENSO in P2, while in P1 the ENSO-related atmospheric circulation anomalies are more similar to a zonally orientated teleconnection pattern. Numerical experiments suggest that the difference in the ENSO-related circulation anomaly in the mid-latitudes is likely related to the difference in climatological mean flow of these two periods.

Biography

XiaoJing Jia has completed her PhD from McGill University and Post-doctoral studies from McGill University Department of Atmospheric and Oceanic Sciences. She is currently working as Professor at ZheJing University. She has published more than 15 papers in highly reputed journals.

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