Geophysical Research Abstracts
Vol. 21, EGU2019-6227, 2019
EGU General Assembly 2019

Observed characteristics of the Springtime Western Pacific pattern and its climate impacts

Anran Zhuge and Benkui Tan
Peking University, School of Physics, Atmospheric and Oceanic Sciences, Beijing, China (1401110211@pku.edu.cn)

Based on daily data from NCEP/DOE reanalysis for 1979-2016 springs (March through May), this study examines the structures and subseasonal variability of the western Pacific pattern (WP) and its climate impacts on both the surface and the polar stratosphere. Results show that the WP pattern, described by the second rotated empirical function (REOF) of the 500hPa geopotential height anomalies, is characterized by the wave train with three anomalous centers located over southern and northern North Pacific and North America, respectively, which assume a barotropic structure through the troposphere. Compared to its wintertime counterpart, the WP pattern in Spring season has a shorter intrinsic timescale of about 8 days. The results also show that when the WP pattern occurs, it causes a seesaw-like surface air temperature anomaly over the area centered at the Bering Sea strait and North America with a magnitude of 4o K or so. Finally, this study further demonstrates that the WP pattern can propagate vertically into stratosphere and causes strong circulation and weather anomalies in the polar stratosphere. Generally, positive (negative) phase WPs weaken (strengthen) the stratospheric polar vortex with a warming (cooling) temperature anomaly there. Occasionally, for some favorable conditions, positive phase WPs may trigger the major or final stratospheric sudden warming events when they propagate into the stratosphere.