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## Inter-annual variability of wintertime monthly surface air temperature in China

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Based on observed and reanalysis data, this study analyzes the spatiotemporal variations of monthly surface temperature in winter in China, their interrelationship and the related anomalous circulation on the inter-annual timescale. The atmospheric internal mechanisms for the inter-annual variation of surface temperature are also discussed. The dominant inter-annual mode is uniform across China, except in the Tibetan Plateau, for all winter months, while the second mode is a north-south dipole mode with opposite sign. The dominant inter-annual modes of surface temperature in January and February are closely correlated to each other in phase, but are to some extent negatively correlated with that in the prior December. The dominant inter-annual modes of monthly surface temperature in winter are also linked to the opposite-sign dipole anomalous patterns of surface temperature in the Eurasian continent. The anomalous temperature signals associated with the nationwide winter surface temperature anomalies may extend up to high levels in the troposphere, with the most intense signals at the surface. The surface temperature anomalies may induce the air temperature anomalies from the near surface to the upper troposphere via the upward long wave radiation flux anomalies emitted from the underlying surface. In all winter months, the intensified westerly over the northern Eurasian continent hinders the southward intrusion of cold air from high latitudes, and then results in a deep warm anomaly over winter in China, and an even larger part of the Eurasian continent.

### Biography

Maoqiu Jian has completed his PhD from Sun Yat-sen University of China. He is a Professor of school of Atmospheric Sciences, Sun Yat-sen University, a top ten university in China. He has published more than 60 papers in reputed journals.

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