



## **Why the summer warming appears more dramatic over Europe-West Asia and Northeast Asia after the mid-1990s?**

Xiaowei Hong (1), Riyu Lu (2), Shuanglin Li (3,4)

(1) Institute of Atmospheric Physics, Climate Change Research Center, Beijing, China (hongxw@mail.iap.ac.cn), (2) Institute of Atmospheric Physics, State Key Laboratory of Numerical Modeling for Atmospheric Sciences and Geophysical Fluid Dynamics, Beijing, China (lr@mail.iap.ac.cn), (3) Institute of Atmospheric Physics, Nansen-Zhu International Research Centre, Beijing, China (shuanglin.li@mail.iap.ac.cn), (4) China University of Geosciences, Wuhan, China (Shuanglin.li@mail.iap.ac.cn)

Regional temperature changes are a crucial factor in affecting agriculture, ecosystems and societies, which depend greatly on local temperatures. We identify a nonuniform warming pattern in summer around the mid-1990s over the Eurasian continent, with a predominant amplified warming over Europe-West Asia and Northeast Asia but much weaker warming over Central Asia. We find that the phase shift of Atlantic Multi-decadal Oscillation (AMO) in the mid-1990s is responsible for the zonally nonuniform warming. The AMO induces the zonal discrepancy in temperature changes through modulating decadal variability of the Silk Road Pattern (SRP), which is an upper-tropospheric teleconnection pattern over the Eurasian continent during summer. Our findings have important implications on decadal prediction of regional warming pattern in the Eurasian continent based on the predictable AMO.