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Remote response of the spring heat source over the Tibetan Plateau in interannual variability to the North Atlantic SSTA

Anmin Duan and Yangfan Cui

Institute of Atmospheric Physics, State Key Laboratory of Numerical Modeling for Atmospheric Sciences and Geophysical Fluid Dynamics, Beijing, China (amduan@lasg.iap.ac.cn)

Data analysis indicates that the interannual variability of spring sensible heating (SH) over the Tibetan Plateau (TP) depends mainly on the intensity of above westerly jet, which is closely related to the leading mode of sea surface temperature anomaly (SSTA) over the North Atlantic, i.e. the SSTA tripole pattern. Such a pattern can be attributed to a result of the atmospheric forcing of the preceding winter and coinstantaneous spring North Atlantic Oscillation (NAO). Numerical experiments with idealized diabatic heating profile in a linear baroclinic model and the North Atlantic SSTA tripole pattern forcing in an atmospheric general circulation model (AGCM) are carried out to investigate the remote response of the circulation over the TP. Results demonstrate that the warm core of the tripole pattern generates a steady Rossby wave train to the downstream, and the two cold cores to its north and south sides can modulate the location and intensity of the wave train to a certain degree. The combined effect of the SSTA tripole pattern in the North Atlantic further enhances the spring westerly and the resultant SH over the TP.