

EGU21-7742, updated on 16 May 2022

<https://doi.org/10.5194/egusphere-egu21-7742>

EGU General Assembly 2021

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



Inter-decadal Change of Tibetan Plateau Vortices during the past four Decades and its Possible Mechanism

Zhiqiang Lin, Weidong Guo, Xiuping Yao, Jun Du, and Jun Ge
Nanjing University, China (linzq82@gmail.com)

The Tibetan Plateau vortices (TPVs) are mesoscale weather systems active at the near-surface of the Tibetan Plateau (TP), which are one of the major precipitation-producing systems over the TP and its surrounding areas. TPVs mainly occur in the warm season from May to September. In this paper, we investigate the inter-decadal change of TPVs in the warm seasons of 1979–2017 by analyzing five widely used reanalysis datasets. A significant change of the TPVs' frequency appears around the mid-1990s, associated with less TPVs during 1979–1996 and more TPVs during 1997–2017. The abrupt change is caused by a transition of the Atlantic Multi-decadal Oscillation (AMO) from a cold phase to a warm phase in the mid-1990s. The shift of AMO leads to a silk-road pattern wave train and a spatially asymmetric change of tropospheric temperature. It modifies the intensity of the subtropical westerly jet and the TP heating, leading to the inter-decadal change of TPV activities.