Geophysical Research Abstracts
Vol. 20, EGU2018-7702, 2018
EGU General Assembly 2018

Comparison of Statistic Characteristics and Atmospheric Circulation of two-category MCSs near the Second-step Terrain in the Middle of the Yangtze River

Ruyi Yang (1,2), Yuanchun Zhang (1), Jianhua Sun (1,2)

(1) Institute of Atmospheric Physics, Chinese Academy of Sciences, Beijing,China, (2) University of Chinese Academy of Sciences, Beijing,China

Black body temperature (TBB) data of long-time series and high spatial-temporal resolution is used to track mesoscale convective systems (MCSs) during summer-time from 2000 to 2016 (except 2005) near the second-step terrain in the middle of the Yangtze River based on a model-based automatic tracking method. The selected cases were divided into two categories: the eastward-moving cases and the non-eastward-moving cases. The spatial and temporal distribution, convection intensity and background circulation of these two categories are compared. There is obvious annual variation of the occurrence frequency and most of the cases formate in July. The former category mainly occurrs in the eastern part of the study region, but the latter one mostly appear in the western. The formation time of the two categories reaches the peak in the afternoon, while the eastward-moving cases occurs about one hour earlier than the other. However, another formation peak of non-eastward-moving cases appears in the early morning. Due to the longer lifespan, moving trajectory and more intensity of the MCSs, the eastward-moving cases could impact on the precipitation downstream east of the second step terrain. Comparison of the composite background circulation of the two categories illustrate that configuration of low trough east of Tibetan Plateau (TP) and the western pacific subtropical high (WPSH) in mid-to-lower troposphere favors the formation and moving eastward of the eastward-moving cases. Their development and long-time maintenance could be resulted from the stronger positive vorticity, vertical wind shear in the lower levels and the convergence of abundant moisture transported by strong low-level jet.