



A statistical analysis on the convective activities over the Tibetan Plateau in 16 warm seasons

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Based on the temperature of black body (TBB) of Meteorological Institute Research of Japan, the mesoscale convective systems (MCSs) over the Tibetan Plateau (TP) during all warm seasons (May-September) from 2000 to 2016 (except 2005) were first detected and tracked by using an automatic tracking algorithm and manual verifications, and then analyzed with statistical methods. The detected MCSs were categorized according to whether they moved out of the TP. Main characteristics of these two categories were investigated and compared to each other. Main results are as follows: a) On average, ~ 610 MCSs occurred in one warm season, most of which tended to move eastward. However, only ~ 40 MCSs ($\sim 6.6\%$) were able to move out of the TP. b) Most of the MCSs generated at midafternoon, within two biggest source regions: one lied in the southeast of the TP, and the other was located at the southwest of the TP. However, the source region for the MCSs that could move off the TP was mainly located in the central east of the TP. c) Overall, compared to the MCSs that dissipated over the TP, the MCSs that moved out of the TP generated ~ 1 h earlier, and had larger sizes, longer lifespans, lower TBBs and more significant temperature gradients. d) After the MCSs moved out of the TP, they tended to shrink, along with an increment in TBBs and a decrement in temperature gradients. This indicated that, after moving off the TP, the MCSs usually weakened, while not enhanced.