

Large-scale environmental conditions related to midsummer extreme rainfall events over the southern Japan region

*Atsushi Hamada¹, Yukari N. Takayabu¹

1. Atmosphere and Ocean Research Institute University of Tokyo

The precipitation characteristics of extreme events determined from 13 years during midsummer over the southern Japan region and their relationship with large-scale environmental conditions are examined. Two types of extreme events, extreme rainfall and extreme convective events, were defined, and their characteristic differences are also examined.

There are clear differences in both precipitation characteristics and the related environmental conditions between the two types of extreme events. Vertical structures of both observed precipitation and environmental atmosphere and precipitation characteristics for the rainfall extreme events consist with our previous studies and reinforce the importance of warm-rain processes in the precipitation production. Clear contrasts in the large-scale environmental conditions related to the two types of extreme events are demonstrated, especially in the free troposphere. The environments related to extreme rainfall events exhibit a zonally extended moist anomaly from southern China to the east of Japan, indicating that the excessive moisture transported from the west by a large-scale flow may partially play a role in producing environmental conditions favorable for extreme rainfall.

The relationships with the tropical cyclones and upper-tropospheric dynamical fields are also examined, and are found to be clearly different between the extreme rainfall events and extreme convective events.

Keywords: precipitation, extreme events, large-scale condition, TRMM