A Statistical study of large-scale environment associated with extreme precipitation using AMeDAS and JRA55/ERA5 data

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Large-scale atmospheric circulations associated with extratropical extreme precipitation events around Japan are statistically examined in this study. Extreme precipitation events are defined as top 1.0 percentile precipitation events for the period from 1979 to 2019 using AMeDAS, which is the automated meteorological data acquisition system managed by Japan Meteorological Agency. The AMeDAS observing stations, which comprises approximately 1,300 stations throughout Japan, are objectively separated into several groups using a clustering analysis based on the similarity among the occurrence of the extreme precipitation events. A composite of extreme precipitation events in each cluster shows a different circulation pattern with the moistened local environment. Detailed analysis shows that the dynamically forced ascent is one of the key components for extreme precipitation in the cluster which expands over Kyusyu region.