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Seasonal differences of precipitation and microphysical characteristics over the Asian monsoon region using spaceborne dual-frequency precipitation radar

Moeka Yamaji 1) and Hiroshi G. Takahashi 2)

1) Earth Observation Research Center, Japan Aerospace Exploration Agency
2) Department of Geography, Tokyo Metropolitan University

This study aimed to reveal climatological seasonal variations in the microphysical properties of precipitation over the Asian monsoon region. We used the Dual-frequency Precipitation Radar satellite product aboard the Global Precipitation Measurement Mission Core Observatory for eight years, from 2014 to 2021, to statistically analyze the mass-weighted mean diameter (Dm) and frequency of heavy ice precipitation (graupels and hail). The results showed statistically significant seasonal changes. Microphysical characteristics of large Dm and frequent occurrence of heavy ice precipitation were observed over the Indian subcontinent and Indochina Peninsula in the pre-monsoon season and over the western Himalayan region in the mature-monsoon season, which can be related to the intense and deeply developed precipitation systems. The relationship between precipitation rate and Dm was also confirmed, showing that changes in Dm were not caused only by changes in precipitation rate but were probably induced by changes in precipitation characteristics.