

EGU21-15910

<https://doi.org/10.5194/egusphere-egu21-15910>

EGU General Assembly 2021

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



Spatial patterns of high-elevation precipitation observed through spaceborne precipitation radars

Masafumi Hirose¹ and Hatsuki Fujinami²

¹Meijo University, Department of Environmental Science and Technology, Nagoya, Japan (mhirose@meijo-u.ac.jp)

²Nagoya University, Institute for Space-Earth Environmental Research, Nagoya, Japan (hatsuki@isee.nagoya-u.ac.jp)

Spaceborne-radar precipitation products at high altitudes entail close attention to geographically inherent retrieval uncertainties. The lowest levels free from surface clutter are ~1 km higher in rugged mountainous areas than those over flatlands. The clutter-removal filter masks precipitation echoes at altitudes below 3 km from the surface at the swath edge over narrow valleys in the Himalayas. In this study, precipitation profiles at levels with clutter interference were estimated using an a priori precipitation profile dataset based on near-nadir observations. The corrected precipitation dataset was generated based on the Tropical Rainfall Measuring Mission Precipitation Radar (TRMM PR) product at a spatial resolution of 0.01° around the Trambau Glacier terminus in the Nepal Himalayas, where ground observation sites were installed in 2016. The occurrence frequency of precipitation was considerably small compared with the in situ observation because of limitations in the sensor sensitivity. The occurrence frequency of light precipitation is increased by the Dual-frequency Precipitation Radar (DPR) onboard the Global Precipitation Measurement (GPM) Core Observatory, and the low-level precipitation profile correction mitigates underestimation bias by ~10%. In this presentation, the detectability of fine-scale precipitation climatology and the local characteristics of its diurnal variation at high altitudes are discussed based the combination of the TRMM PR and GPM DPR products.