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Detection of localized rainfall maxima and minima

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In this study, the detection capability of orographic rainfall and the spatial features of high-altitude precipitation climates have been investigated on the basis of very high-resolution data obtained from the spaceborne radar (TRMM PR). Rain samples at a certain grid finer than the footprint are correlated with those in the surrounding grids within the radius of each footprint. A larger sample size increases the likelihood that the rain samples at the center grid reflect the mean features of the point. Therefore, the long-term accumulation of precipitation echoes enables us to examine the regional differences in the rainfall at a kilometer scale over the global tropics. This dataset is useful for the better representation of the sharp gradient of rainfall and the retrieval errors fixed to a specific topography. The latter appears as surface-clutter interferences in specific mountainous areas. The former shows a clear geographic association for rainfall over high mountains. In Kilimanjaro, the mean rainfall over foothills is 10 times higher than that over its summit. The spatial contrast of the rainfall is remarkable on the island of New Guinea. The 0.01 degree rainfall over the highest peak of Oceania is only 1 mm per day; whereas, it is 28 mm per day over the adjacent slope area, which is approximately 30 km away from the ridge.