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# Spatial-temporal variability of precipitation in Mountainous Regions in the Southern Appalachians

O.P. Prat and A.P. Barros

Duke University, Civil and Environmental Department, Durham, United States (oprat@duke.edu)

The purpose of this work is to investigate the mechanisms of mountainous precipitation and specifically to quantify the influence of the topography on the modification of microphysical and dynamical processes of large weather systems or on the onset of localized convective storms. Three measurement campaigns involving the deployment of one (July-August 2008) or two (October-November 2008, and June-July 2009) Micro Rain Radars (MMR) were conducted in the Great Smoky Mountains National Park (GSMNP) in the Southern Appalachians, with the goal to provide microphysical observations. Here we focus on the characterization of the diurnal cycle of rainfall and the yearly repartition of precipitation both from MRR records and from more than 30 rain gauges deployed from mid- to high-elevation along exposed ridges in the vicinity of the MRR deployment sites. A particular attention is paid to the quantification of space-time patterns of orographic enhancements between valley and ridge locations for the MRR deployment sites. The second aspect of this work, concerns a comparison of raingauge and vertically pointing radars (MRR) records with TRMM 2A25 precipitation products. A long term (from 6 months to more than two years and depending on the rain gauge installation) systematic statistical analysis is performed in order to quantify differences between ground based and remotely sensed observations for precipitation events at the time of satellite overpass. The presentation will provide a synthesis of data analysis and sensor intercomparison.