

# **X-band Dual-Polarization Radar Based Hydrometeor Classification For Tropical Precipitation Systems: The Amazonas Seasonal Clustering Differences**

J-F. Ribaud, L.A.T Machado, and T. Biscaro

National Institute for Space Research (INPE)  
Center for Weather Forecast and Climate Studies (CPTEC)  
Cachoeira Paulista, SP, BRAZIL

The present study aims at investigating for the first time the 3D evolution of the hydrometeor distributions within Brazilian tropical convective systems retrieved by dual-polarization radar in the frame of both CHUVA and SOS-CHUVA projects. Since such description within tropical precipitation systems is pretty rare or even nonexistent especially over Brazil, hydrometeor dominant type distributions are determined by applying a new clustering based algorithm from research X-band dual polarization measurements. Unlike “classical” Hydrometeor Classification Algorithms (HCA) such as fuzzy logic, this clustering approach allows to directly make the use of the radar measurements without making any first assumptions about polarimetric observable boundaries for each one of the microphysical species.

After a description of the clustering methodology and an evaluation of HCA outputs, this study will present the evolution of the retrieved microphysics through precipitation events observed during both dry and wet seasons.