

***CHARACTERISTICS OF STRATIFORM AND CONVECTIVE PRECIPITATION AT  
DARWIN DURING 2007***

Mary Jane Bartholomew, *Brookhaven National Laboratory*  
Michael Jensen, *Brookhaven National Laboratory*  
Pavlos Kollias, *McGill University*

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**Environmental Sciences Department/Atmospheric Sciences Division**  
**Brookhaven National Laboratory**  
P.O. Box, Upton, NY  
[www.bnl.gov](http://www.bnl.gov)

**ABSTRACT**

The extensive Millimeter Cloud Radar (MMCR) and disdrometer data set collected at the Tropical Western Pacific Darwin site provides enough data to statistically examine the characteristic features of monsoon precipitation at this location. The stratiform or convective nature of the rain can be determined by an analysis of the MMCR reflectivity and mean Doppler velocity values as a function of height in a manner similar to the classifications done by White et. al (2002) and Geerts and Dawei (2004). This classification has been carried out for more than 1.8 million MMCR profiles. The results of this analysis suggest that 25% of the rain is convective and the rest is stratiform. A stratiform rain fraction of 75% is at the high end, but within the range of 25% to 85% reported in the literature for the tropics. Subsequently, moments from the disdrometer drop spectra were used to calculate the intercept, slope and shape parameters ( $N_0$ ,  $\lambda$  and  $m$ ) of a gamma distribution for each observation (more than 13000 observations). The results from the combined analysis of the MMCR profiles and the disdrometer drop spectra indicate that the stratiform drop spectra typically have an intercept ( $N_0$ ) value of  $1.07e5 \text{ mm}^{-1} \text{ m}^{-3}$  and a slope ( $\lambda$ ) value of  $7.06 \text{ mm}^{-1}$  while the corresponding values for the convective drop spectra are  $2.73e5 \text{ mm}^{-1} \text{ m}^{-3}$  and  $6.70 \text{ mm}^{-1}$ . Geerts, B and Y Dawai. 2004. "Classification and characterization of the tropical precipitation based on high-resolution airborne vertical incidence radar. Part 1: classification." *Journal of Applied Meteorology* 43, 1554-1566. White, AB, DJ Gattas, ET Strem, FM Ralph, and PJ Neiman. 2002. "An automated bright band height detection algorithm for use with Doppler radar spectral moments." *Journal of Atmospheric Oceanic Technology* 19, 687-697.