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AMIE Gan Island Ancillary Disdrometer Field Campaign Report

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ARM CLIMATE RESEARCH FACILITY

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Acronyms and Abbreviations

AMF	ARM Mobile Facility
AMIE	ARM MJO Investigation Experiment
ARM	Atmospheric Radiation Measurement
2D	two-dimensional
2DVD	Two-Dimensional Video Disdrometer
DOE	U.S. Department of Energy
MJO	Madden-Julian Oscillation
NCAR	National Center for Atmospheric Research
SACR	Scanning ARM Cloud Radar
SPolKa	dual-wavelength S- and K-bands polarimetric radar
UTC	Coordinated Universal Time

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1.0 Instrumentation

As part of the U.S. Department of Energy (DOE)'s Atmospheric Radiation Measurement Climate Research Facility (ARM) Madden-Julian Oscillation (MJO) Investigation Experiment (AMIE), in January 2012 a disdrometer observation took place with the second ARM Mobile Facility (AMF2), the Scanning ARM Cloud Radar (SACR), the Texas A&M SMART-R C-band radar, and the National Center for Atmospheric Research (NCAR) dual wavelength S- and Ka-bands polarimetric (SPolKa) radar on Gan Island, Maldives. In order to measure raindrop size distributions, a disdrometer of Nagoya University, Japan, was set up close to the ARM Two-Dimensional (2D) Video Disdrometer (2DVD). The SMART-R and SPolKa radars performed range-height-indicator scanning in the direction of the disdrometer site. Comparing the disdrometer data with 2DVD data, the raindrop size distribution data will be calibrated. Furthermore, the analysis of the raindrop size distribution and radar data will be expected to clarify the microphysics in tropical convective clouds.

Figure 1. The disdrometer located in the AMF2 site at Gan Island. The disdrometer (front center of the picture) was located close to the 2DVD (left).

2.0 Data

A mesoscale convective system passed over the disdrometer site on 14-15 January 2012. The disdrometer measured raindrop size distributions from 1900 Coordinated Universal Time (UTC) 14 January to 0600 UTC 15 January. The data show interesting features in the time variation of raindrop size distribution. The distribution changes from dominance of large raindrops to high number concentration of small raindrops with time. During the measurements, the radars measured deeply developed convective clouds. The change of the raindrop size distribution represents microphysics in the deeply developed convective clouds. The comparison of the raindrop data with the vertical distribution and time variation of radar data will reveal the microphysical structure in the convective clouds.

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