

# AMIE Gan Island Ancillary Disdrometer Field Campaign Report

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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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