*README*

*Fast-Cloud Droplet Probe (CDP) Dataset*

*GOAmazon*

*Phase 1: Feb. 22 – Mar. 23, 2014*

*Phase2: Sep. 6 – Oct. 4, 2014*

*Contact:*

*Fan Mei, ARM Aerial Facility, PNNL*

fan.mei@pnnl.gov

# Data Source

These data were collected onboard the Gulfstream-1 operated by Battelle for the U.S. Department of Energy DOE during the Atmospheric Radiation Measurement (ARM) programs GOAmazon field campaign as part of a joint ARM Aerial Facility (AAF) and ARM Mobile Facility (AMF) deployment (Principle Investigator Scot Martin, Harvard University).

## 1.1 Location

Aircraft flights were based out of Eduardo Gomes Airport, Manaus, Amazonas, Brazil. Flight plans focused on sampling the Manaus plume and convective clouds in the vicinity of Manaus and over the ARM Mobile Facility located near Manacaparu. Level legs typically included legs below cloud base, then inside and above cloud.

## 1.2 Time period of collection

Flights occurred Feb. 22 – Mar. 23, 2014 and Sep. 6 – Oct. 4, 2014.

## 1.3 Instrument description

The Fast Cloud Droplet Probe is manufactured SPEC, Inc. (<http://www.specinc.com>) measures particle size and concentration. FCDP sizes particles by measuring the amount of light scattered into the collecting optics aperture during particle interaction through a focused laser beam. The instrument can size particles from 1-50 μm with a resolution of about 3 μm. The system resolves particles into twenty equally spaced bins. It is capable of sizing particles having velocities from 10-200 m/s

# 3.0 File Format

The file format follows the ICARTT format (http://www-air.larc.nasa.gov/missions/etc/ESDS-RFC-019-v1.1\_0.pdf ), which is a standardized file format designed for aerial platforms by the Inter-Agency Working Group For Airborne Data And Telemetry Systems (IWGADTS: http://www.eol.ucar.edu/iwgadts/index.html). All data are 1 sec temporal resolution.

## 3.1 File naming convention

The file naming convention also follows the ICARTT standard:

FCDP\_G1\_YYYYMMDDHHMMSS\_R2\_GoAmazon001s.ict

Table 1: Explanation of file naming convention for FCDP data.

|  |  |
| --- | --- |
| Label | Notes |
| FCDP | Instrument Name |
| G1 | Aircraft Platform |
| YYYYMMDD | YearMonthDay |
| HHMMSS | HourMinuteSecond |
| R2 | Revision |
| GoAmazon | Field Campaign Name |
| 001s | Denotes 1 Hz data |

## 3.2 Data description

Table 2: Description of column data provided in FCDP data files. All bin sizes are listed in microns. See a sample data file for a list of all bin sizes.

|  |  |  |  |
| --- | --- | --- | --- |
| Column | Column Name | Units | Description |
| 1 | Time | seconds | Seconds since midnight |
| 2 | Conc(#/L) | (#/L/μm) | Total number concentration |
| 3 | C:0-1.5 | (#/L/ μm) | Number concentration in Bin 1 0-1.5 μm |
| 4 | C:1.5-3 | (#/L/ μm) | Number concentration in Bin 2 3.0-4.0 μm  |
| 5 | C:3-4 | (#/L/ μm) | Number concentration in Bin 3 4.0-5.0 μm  |
| 6 | C:4-5 | (#/L/ μm) | Number concentration in Bin 4 5.0-6.0 μm  |
| 7 | C:5-6 | (#/L/ μm) | Number concentration in Bin 5 6.0-7.0 μm  |
| 8 | … |  |  |
| 20 | C:50-150 | (#/L/ μm) | Number Concentration in Bin 20 50-150 μm |