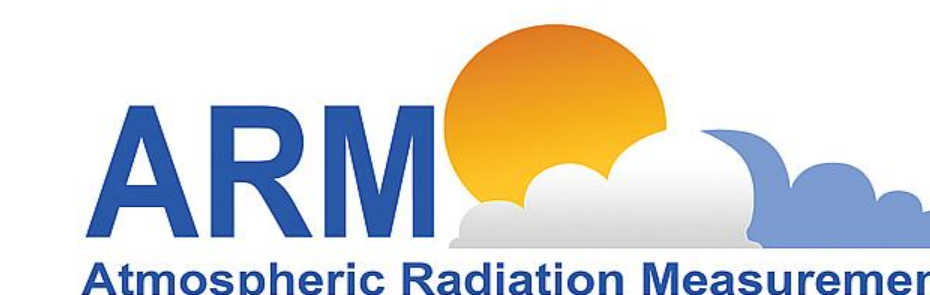


# New Data Support Activities for the Fast-physics System Testbed & Research (FASTER) Project



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## What is FASTER?

The multi-institutional project aims to evaluate and improve parameterizations of fast processes (those involving clouds, precipitation, and aerosols) in global climate models, using a combination of numerical prediction models, single-column models, cloud-resolving models, large-eddy simulations, full global climate model output, and ARM active and passive remote sensing and in situ data.

## Summary

[faster.arm.gov](http://faster.arm.gov)

The FASTER Data Support effort provides datasets *customized* to the needs of FASTER GCM, CRM and LES modelers.

Select products will be made available to the ARM community.

## Data Products

Products Introduced Last Year (for SGP: March 2000, May 2003):

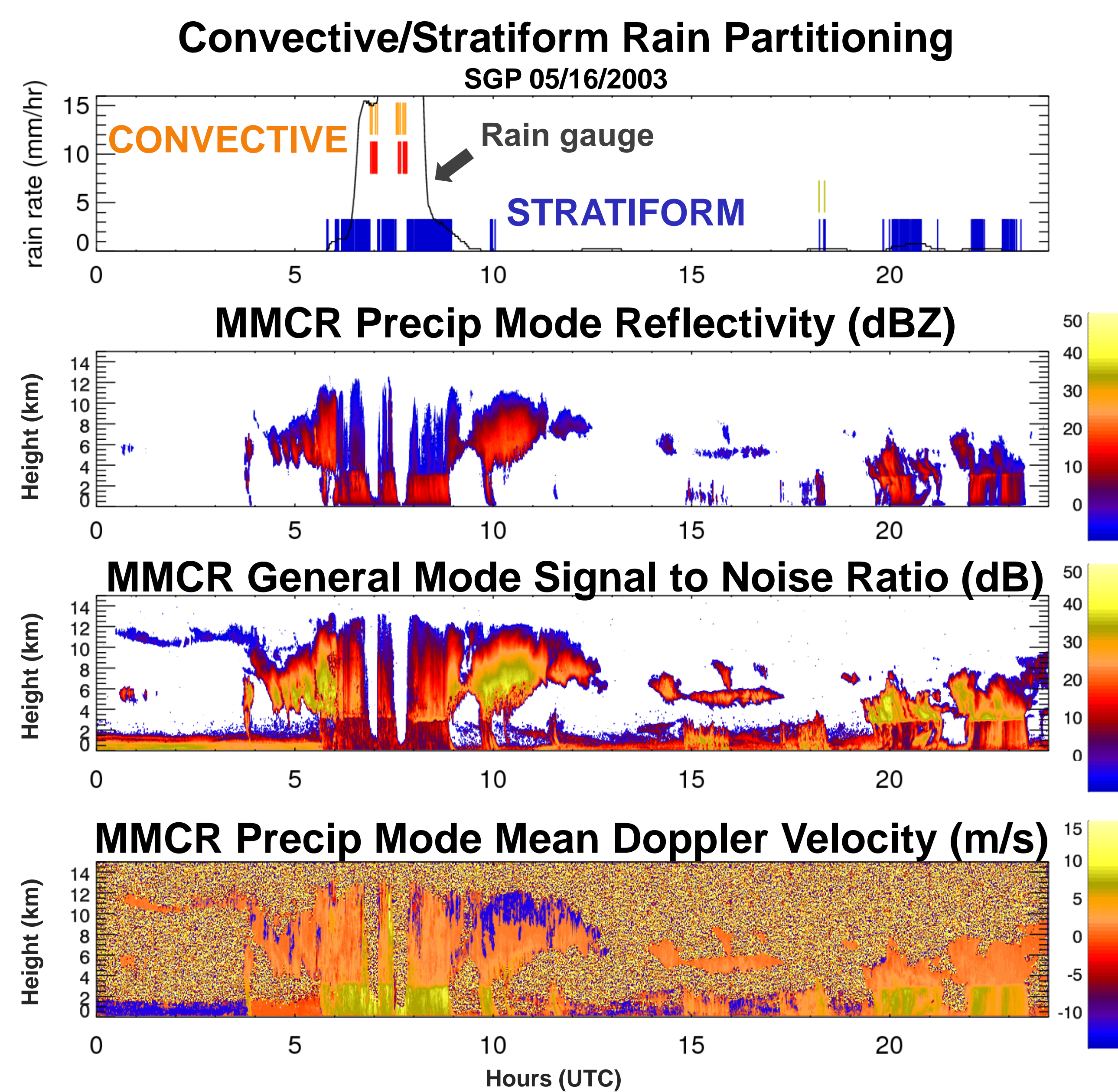
- CLDMDL (a CMBE-like dataset)
- Gridded precipitation product based on ABRFC
- Soil moisture and temperature profiling product based on SWATS

Products Introduced This Year:

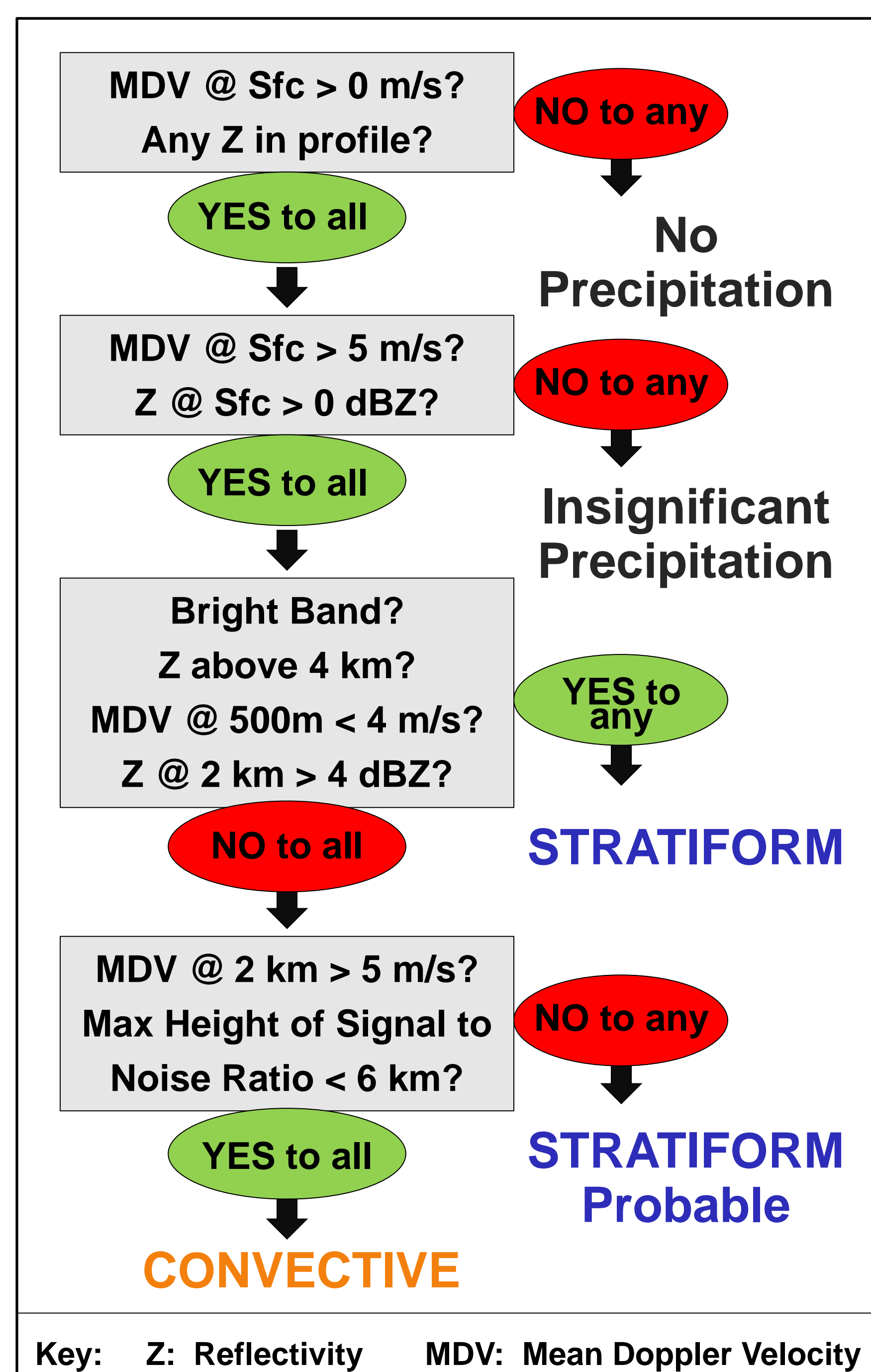
1. Convective/Stratiform Rain Partitioning
2. CAPE/CIN
3. RACORO Statistical Plots
4. Aerosol IOP / MASRAD / MASE Products

## 1. Convective/Stratiform Rain Partitioning Product

MMCR-based algorithm recognizes attenuation caused by convective precipitation.



Data Availability: SGP (2000 - 2007)



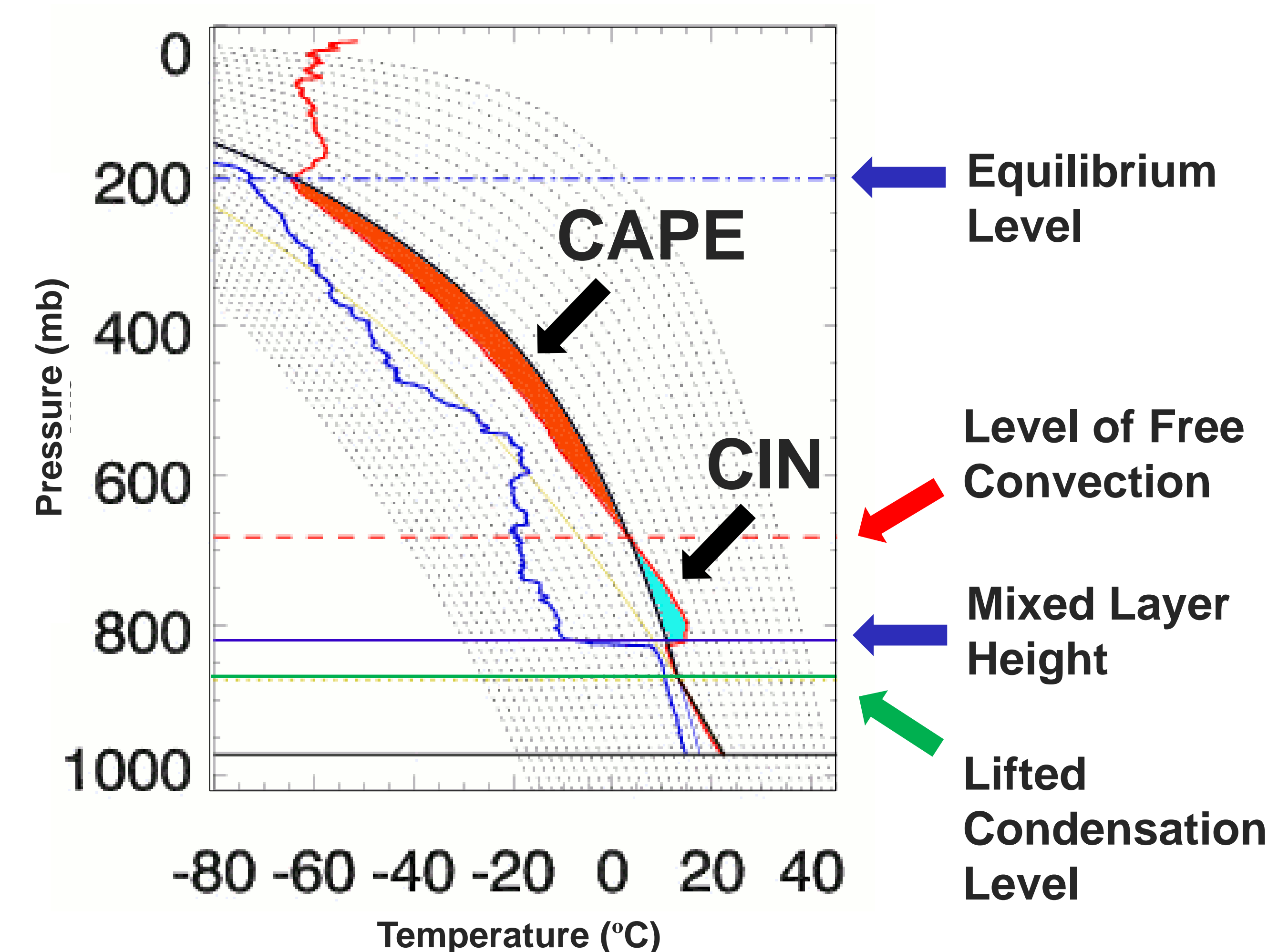
Key: Z: Reflectivity MDV: Mean Doppler Velocity

## 2. CAPE/CIN Product

ARM soundings are used to determine surface-based Convective Available Potential Energy (CAPE), Convective Inhibition (CIN) and associated properties.

The level from which to raise the parcel is the level of the maximum virtual temperature within the first kilometer.

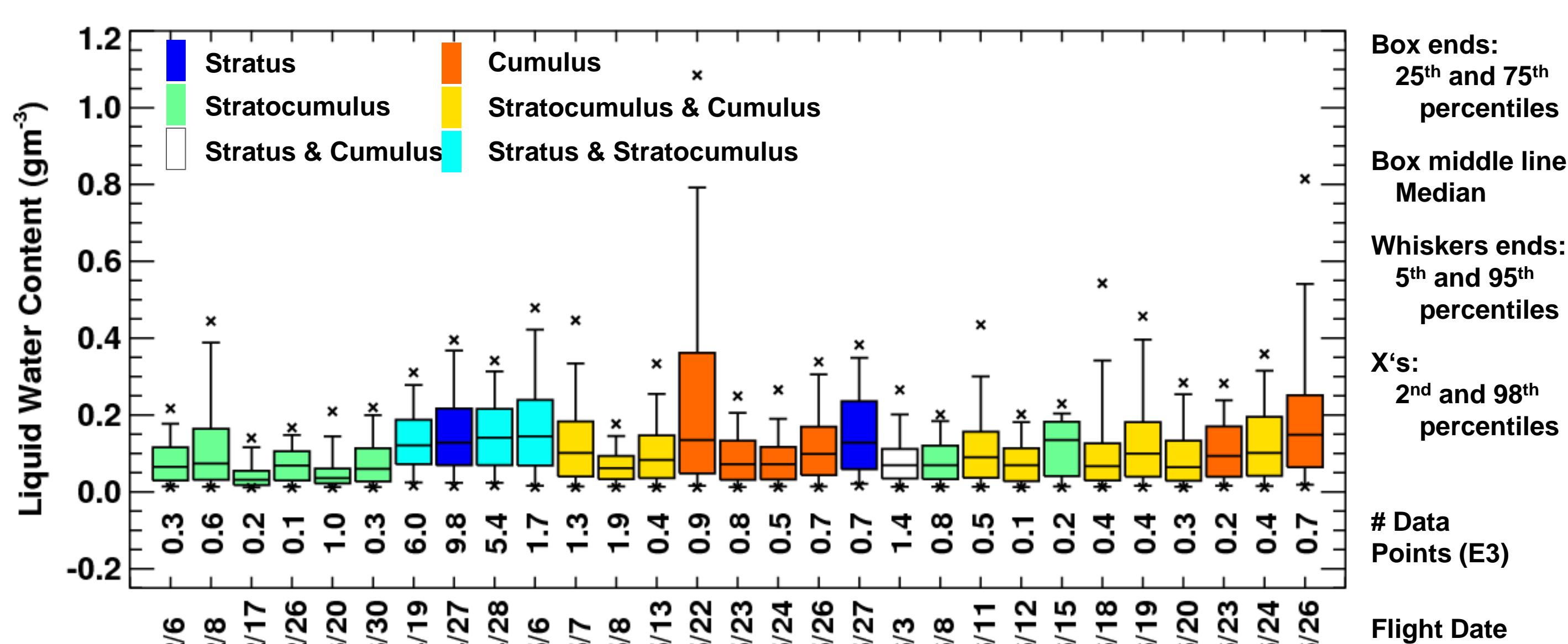
Integrations use virtual potential temperature.



Data Availability: • SGP (1993 - 2009) • Azores • Niamey  
• TWP (2001 - 2009) • Black Forest • Point Reyes  
• NSA (2002 - 2009) • China

## 3. \*RACORO Statistical Plots

Statistical plots have been generated for RACORO period aircraft and surface aerosol data, such as that shown below.



\*RACORO: Routine AAF Clouds with Low Optical Water Depths (CLOWD) Optical Radiative Observations

Partial list of variables included in RACORO, Aerosol IOP, MASRAD and MACE statistics:

### Aircraft Statistics:

- Temperature
- Water Vapor Mixing Ratio
- Vertical Velocity
- CCN (variable SS)
- Aerosol Number Concentration
- Liquid Water Content
- Cloud Extinction
- Effective Radius
- Drop Number Concentration
- Aerosol Size Distribution
- Cloud Drop Size Distribution

### Surface Aerosol Statistics:

• CN and CCN (0.2% SS) (AOS/TDMA)

Meteorological variable profile plots available for RACORO period as well.

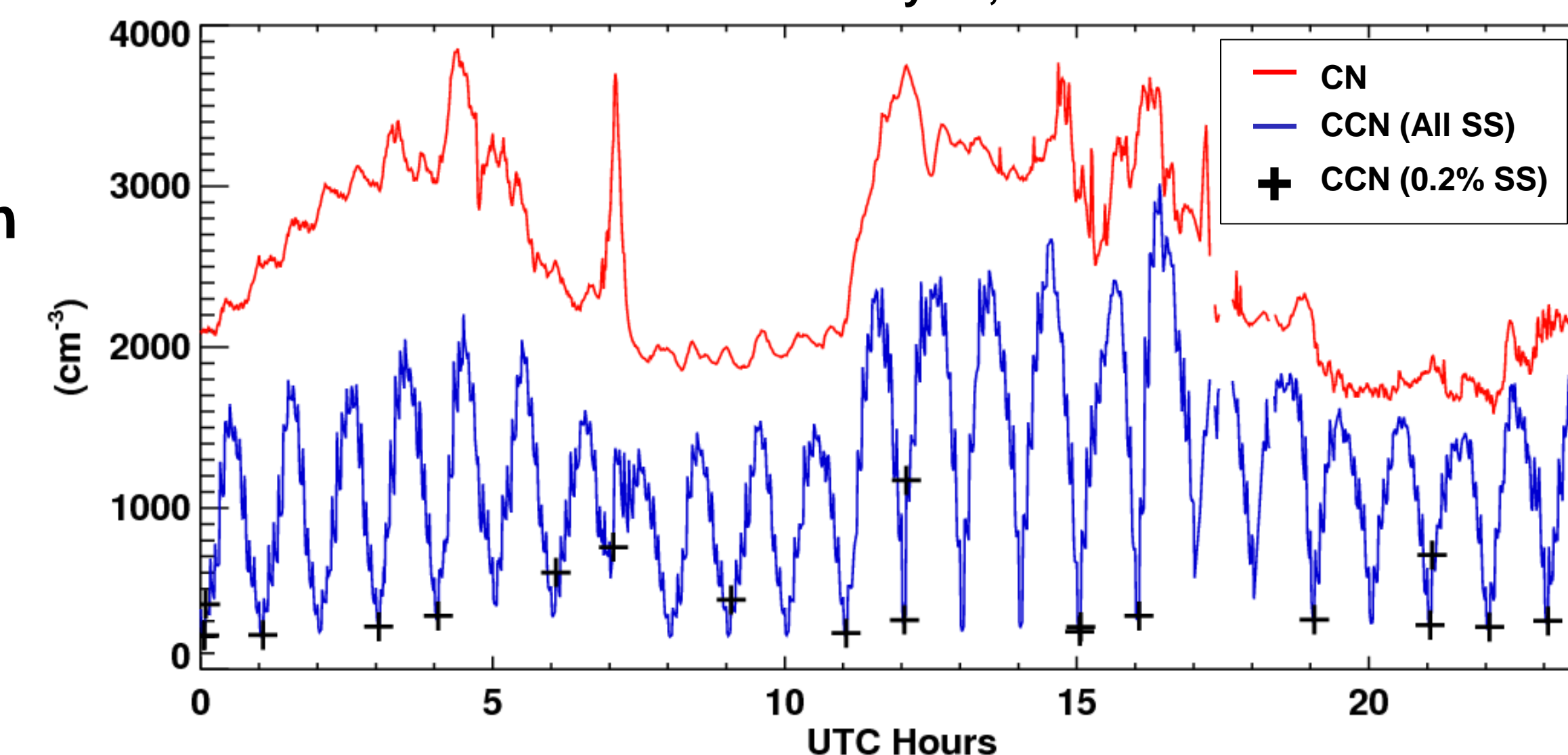
## 4. Aerosol IOP / \*MASRAD / \*\*MASE Products

Daily and hourly statistics:

- Mean
- Median
- Standard deviation
- 10<sup>th</sup>, 25<sup>th</sup>, 75<sup>th</sup>, 90<sup>th</sup> percentiles

GISS gridded profiles

CN, CCN (Aerosol Observing System)  
MASRAD May 25, 2005



\*MASRAD: MARine Stratus Radiation Aerosol and Drizzle IOP  
\*\*MASE: Marine Stratus Stratocumulus Experiment

Funded by:  
U.S. DOE  
Earth System Modeling  
Program

Shaocheng Xie  
Renata McCoy  
Betsy Andrews

Acknowledgments:  
Gijs de Boer  
Surabi Menon  
Anne Jefferson  
Greg McFarquhar  
Hafidi Jonsson

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