PR/TMI/Comb (bias removed)
Super Typhoon Paka
December 1997
Tropical Rainfall Anomalies
(TRMM Land Retrievals)

Monthly Mean Rainfall (land only)
(Selected Region: 30S-30N, 0-360E)
Tropical Rainfall Anomalies
(TRMM Ocean Retrievals)

Monthly Mean Rainfall (ocean only)
(Selected Region: 30S-30N, 0-360E)
Microwave Radiometer

Olson (1987)

Kummerow (1988)

Spencer (1986)
Microwave Radiometer
TMI 2A-12 Algorithm

TB observed

~10 km

TB model #1

TB model #2

TB model #3
Current Rainfall product Status

- 3-D CRM with 2-3 km spatial resolution & explicit ice microphysics forms basis of current retrievals

- Instantaneous rainfall products are good & enough observation are likely to have significant impact:
  - Data Assimilation
  - Forecast Model Initialization

- Sensitivity to regional & time dependent uncertainty is subject of current research
A New Algorithm for TRMM/GPM

CORE SATELLITE
- Dual frequency radar
- Multifrequency radiometer
- Non-sun synchronous orbit
- $\sim 70^\circ$ inclination
- $\sim 400 - 500$ km altitude
- $\sim 4$ km horizontal resolution
- 250 m vertical resolution

MISSION: Understand the horizontal and vertical structure of rainfall and its microphysical elements. Provide training for constellation radiometers.

CONSTELLATION SATELLITES
- 8 small satellites with microwave radiometer only*
- 3 hr revisit time
- Sun-synchronous polar orbit
- $\sim 600$ km altitude

*Some of the 8 small satellites may be replaced by existing radiometers (e.g., SSM/I, AMSR, etc.)

MISSION: Provide enough sampling to reduce uncertainty in short-term rainfall accumulations. Extend scientific and societal applications.
2-D CRMs

• Observations provide statistical verification of rainfall and vertical structure. Direct radiance comparisons are possible. Probable impact on microphysical parameterizations.

• By GPM era (2008), if not before, observations will provide changes in cloud morphology associated with large scale circulation changes (currently known as regional biases).

• Observations can provide validation for 2-D CRM statistics for grid box applications.