Radar Observations of Convection in NAMMA

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Goals for TOGA Radar Observations in NAMMA

- Collect radar data and assist in guidance of DC-8 during field phase
- Analyze precipitation and circulation structures within maritime MCSs in the vicinity of the Cape Verde islands and describe the progression of their structure and behavior as they transition from the African continent to a more maritime environment
- Document kinematic, microphysical, and precipitation features, internal to these MCSs, that are relevant to tropical cyclogenesis

TRMM Background Climatology

1998-2004 JATRMM-based MCS climatology over Africa and tropical Atlantic

- Flash density from TRMM LIF
- Approximate region of TOGA coverage
- JJA rain from TRMM PR
- JJA stratiform from TRMM PR (% rain that is stratiform)
- JJA ITCZ MCSs from TRMM PR/7 (6% MCS with extensive ice scattering)

Figure courtesy of Steve Moblit:
- The Cape Verde islands are in a transition region between intense land-based convection over Africa and weaker maritime convection over the open ocean

12-13 September "Pre-Helene" Convection

Observed Features of Interest in Major Events:
- Classic leading line convection - trailing stratiform MCSs
- Leading stratiform - trailing convection MCSs
- Narrow convective bands (> 100 km in length) with no accompanying stratiform
- Orographic forced convection over islands
- Broad scale cyclonic circulation and embedded vortices

TOGA Radar QC Issues

- Ground clutter and side lobes removed using a clutter template for each sweep
- Multiple trip echo removed using a VR mask
- Sea clutter removed using vertical reflectivity gradient threshold
- The radar data contains multiple artifacts that must be removed before it can be used for research analyses
- Calibration bias determined from comparisons between TOGA and TRMM PR
- Based on 4 overpass intercomparisons (22 August, 3 September, 12 September, and 14 September), TOGA is 4.0 dB (±2.2 dB) high relative to TRMM PR

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