“CONVECTIVE CLOUDS SPACE AND TIME ORGANIZATION: THE REGIONAL DIFFERENCES”

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Objective

Investigate the space and time organization of the convective clouds and rain cells during the CHUVA campaigns.
Methodology

- **Fortracc Satellite set up**
  - Minimum Size: 20 pixels = 320km²;
  - Field: Brightness Temperature Ch4 (K);
  - Spatial resolution = 4km;
  - Threshold BT = 235 K;

- **Sites**
  - Fortaleza;
  - Belém;
  - Vale;
  - Santa Maria;
Average Direction of Propagation and Speed of Convective Systems

FORTRACC SATELLITE
Frequencies of Convective Systems in (4 x 4) km area during CHUVA Campaigns

Site Fortaleza - ForTracc Satellite

Site Belem - ForTracc Satellite

Site Santa Maria - ForTracc Satellite
Frequencies of Convective Systems in (4 x 4) km area during CHUVA-VALE Campaign
Average Direction of Propagation and Speed of CS during CHUVA-VALE Campaign
Histogram Size of the Convective System for CHUVA Campaigns

- Histogram Size of the CS
- Frequency (%)
- Convective System Radius (km)

Fortaleza, Belém, Vale, Santa Maria
Histogram Life Cycle Duration of the Convective System during CHUVA Campaigns

Histogram Life Cycle Duration of the CS in Site CHUVA

- Fortaleza
- Belém
- Vale
- Santa Maria
Conclusions

✓ MCSs in Santa Maria are faster than any other region;

✓ The frequency of occurrence are normally associated with orography or on the coast as in Fortaleza.

✓ Size distribution for all regions are very close, Santa Maria presents the larger, followed by Belém.

✓ The Life Time durations are also very close among all regions.

✓ Further investigations with radar will give a better understand of the physical processes associated to the regions.
Studies Underway

✓ Space-Time organization of the rain cells - XPOL Radar and FORTRACC;

✓ Reflectivity profiles as function of the Life Cycle – Regional differences;

- Radar Banda-X:
  ✓ Zdr;
  ✓ R(dBZ);
  ✓ Kdp;

- Fortracc – Radar:
  ✓ Capli in 2km;
  ✓ Threshold : Dbz > 1;
  ✓ Size > 100 pixels (4 km²);
MCS Life cycle and convective cloud cover and theirs relations to the dynamics and thermodynamics properties (moisture convergence, upper level divergence, CAPE, CINE, etc.). The regional differences.

- Parameter:
  - CAPE;
  - CINE;
  - Div. Humidity;
  - Div. Wind;

- Variables:
  - Rain;
  - Clouds Cover;