"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

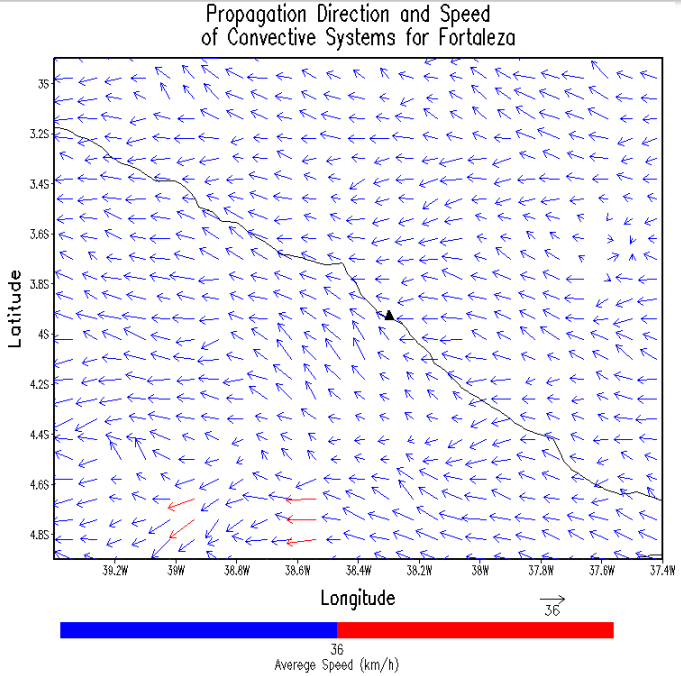
➢ Fortracc Satellite set up

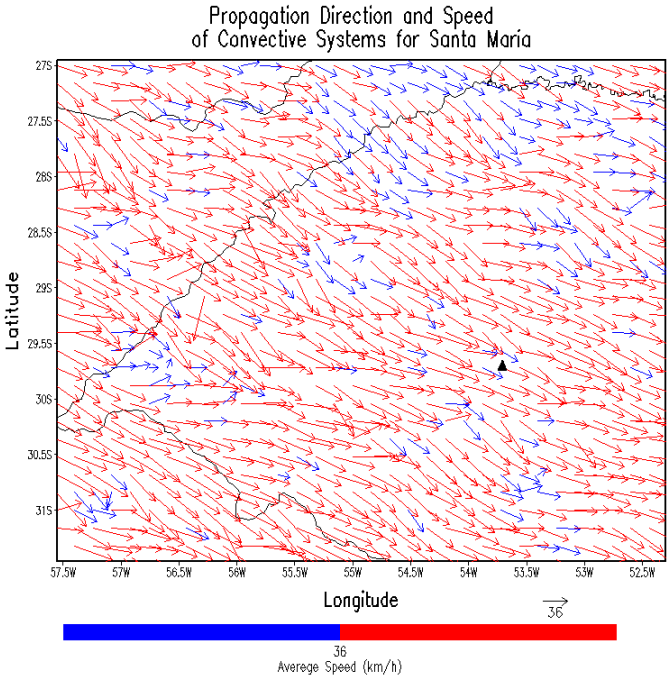
- ✓ Minimum Size: 20 pixels = 320km²;
- ✓ Field : Brightness Temperature Ch4 (K);
- ✓ Spatial resolution = 4km;
- ✓ Threshold BT = 235 K ;

➢ Sites

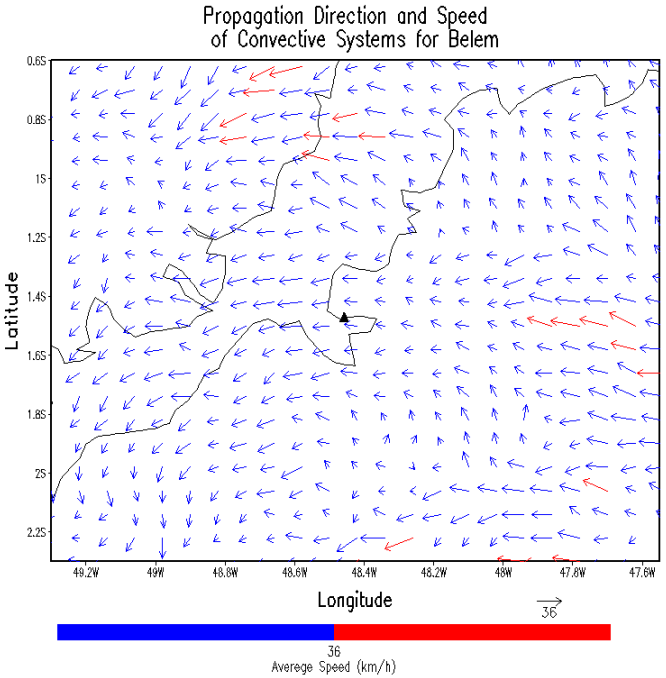
- ✓Fortaleza;
- ✓ Belém;
- ✓ Vale;
- ✓ Santa Maria;

➢ Average Direction of Propagation and Speed of Convective Systems

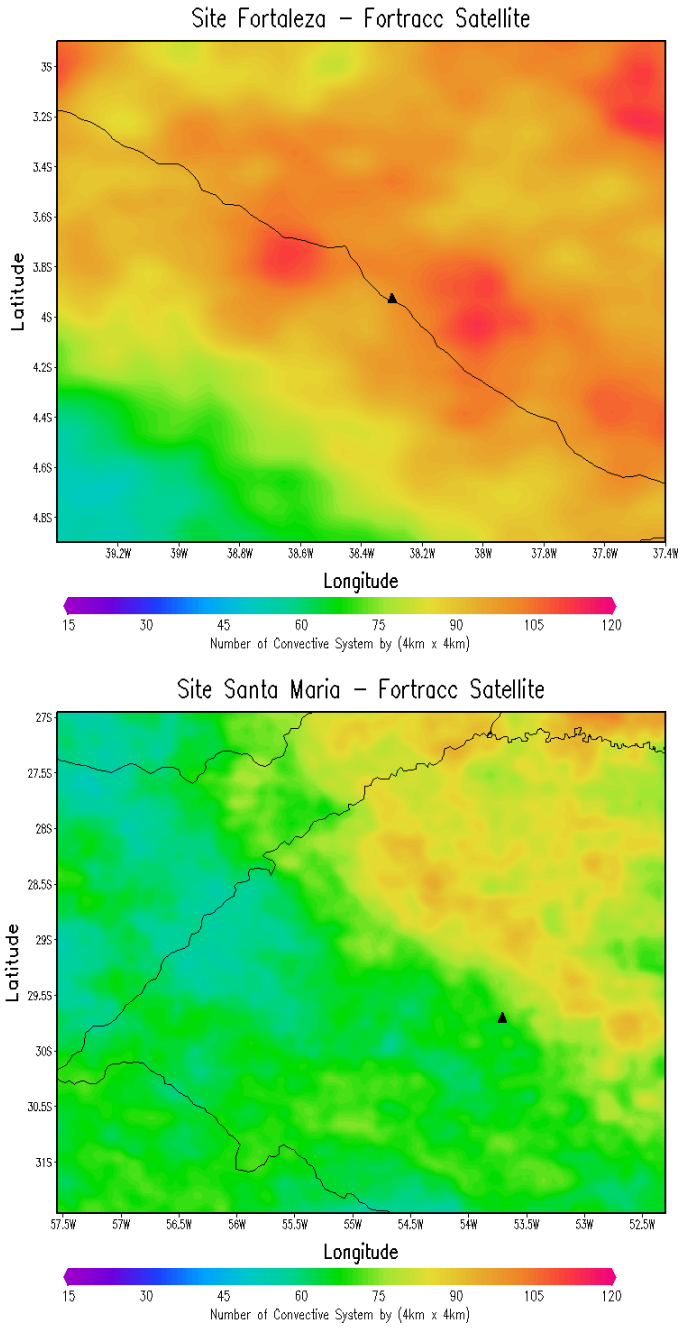




FORTRACC SATELLITE



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



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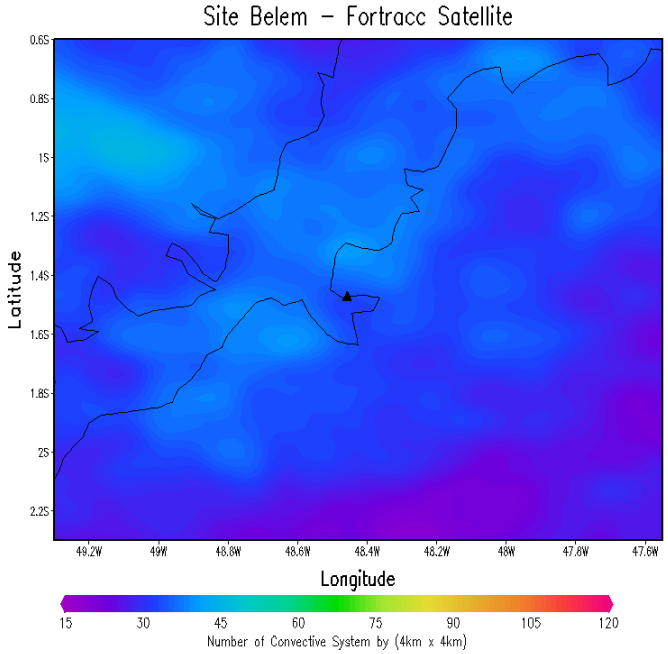
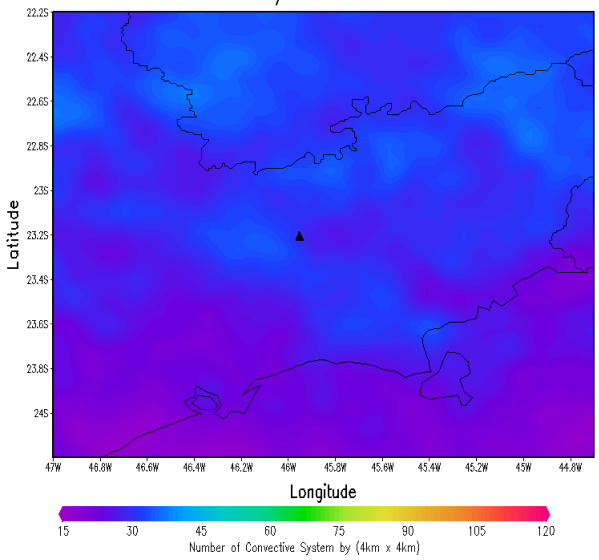


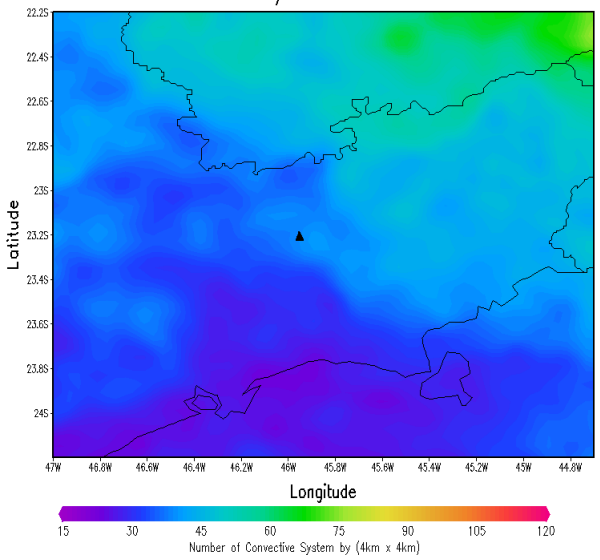
➢ Frequencies of Convective Systems in (4 x 4) km area during CHUVA-VALE Campaign

FORTRACC SATELLITE

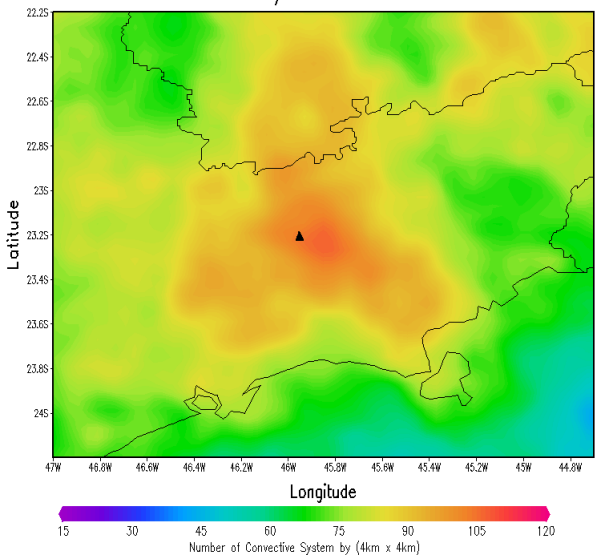
Site Vale – Nov/2012 – Fortracc Satellite



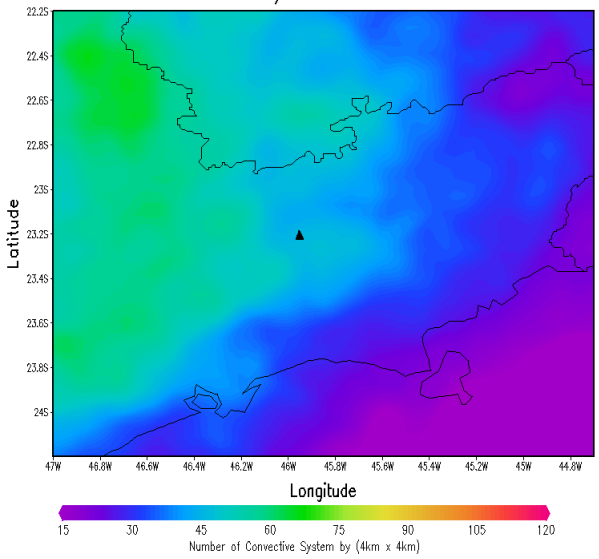
Site Vale – Dec/2012 – Fortracc Satellite



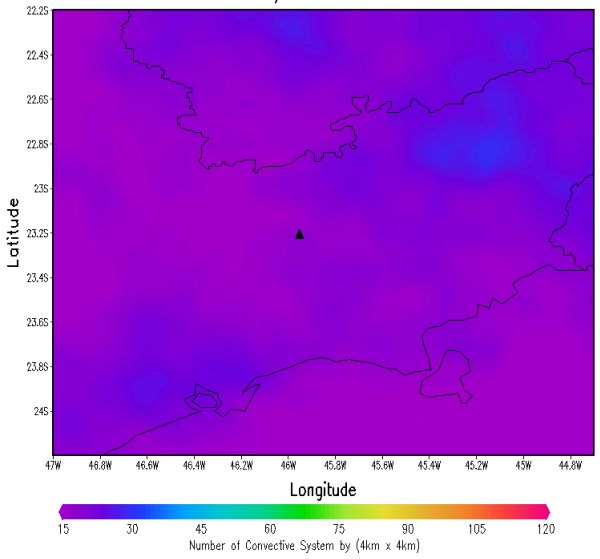
Site Vale – Jan/2012 – Fortracc Satellite



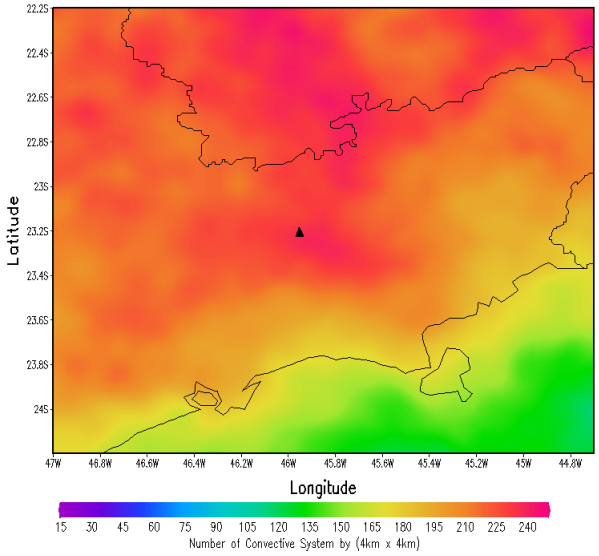
Site Vale – Feb/2012 – Fortracc Satellite



Site Vale – Mar/2012 – Fortracc Satellite

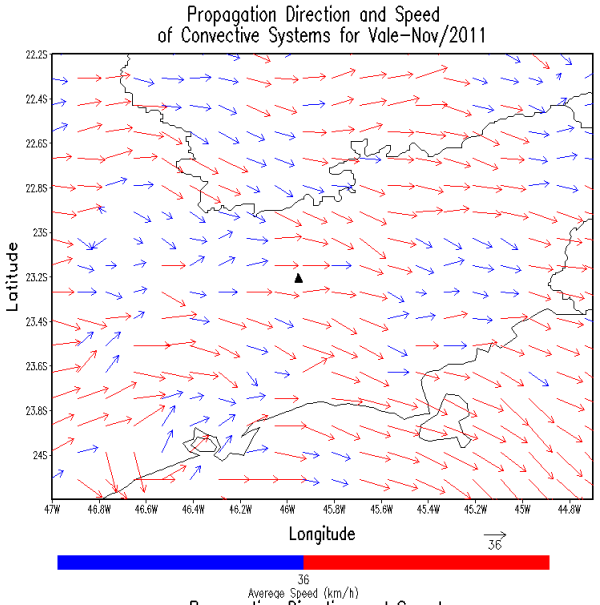


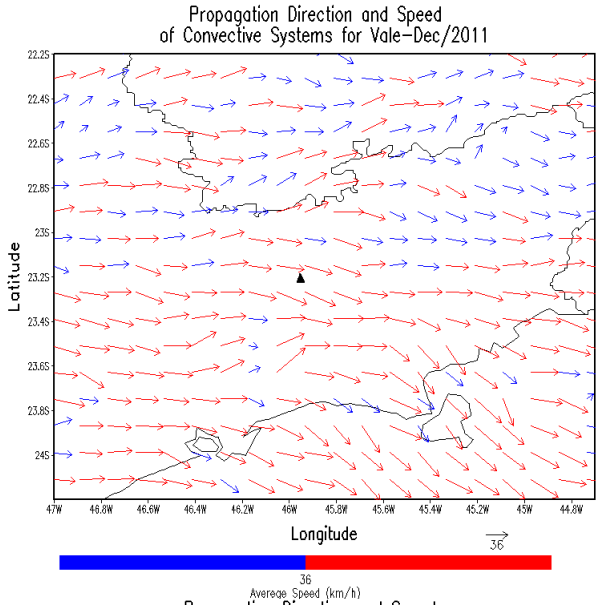
Site Vale – All – Fortracc Satellite

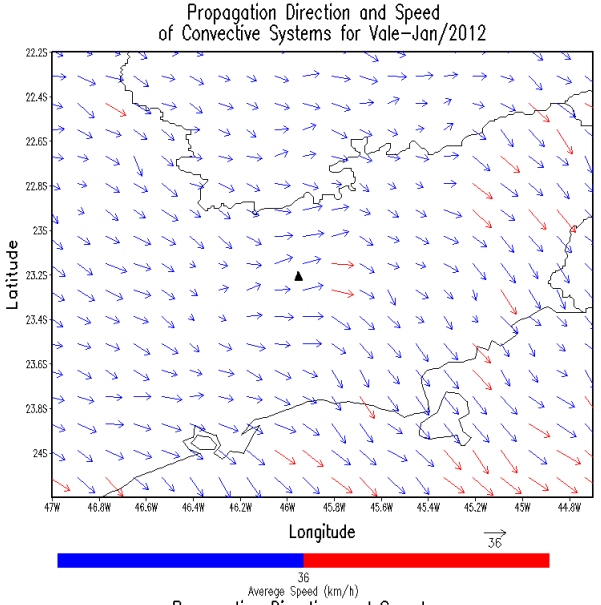


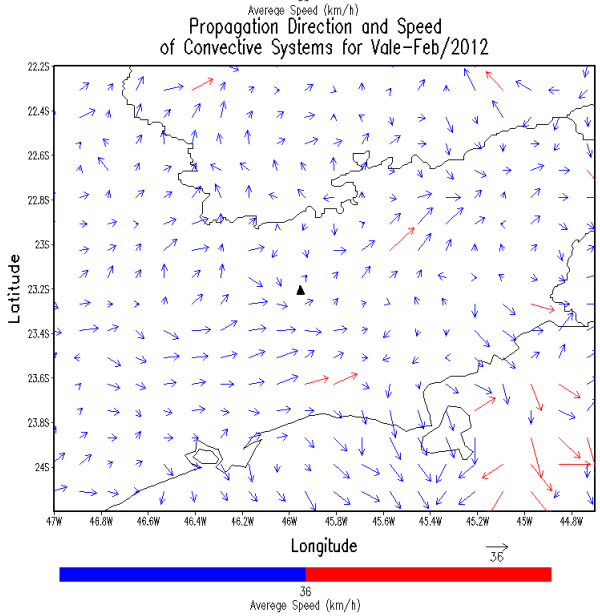
Average Direction of Propagation and Speed of CS during CHUVA-VALE Campaign

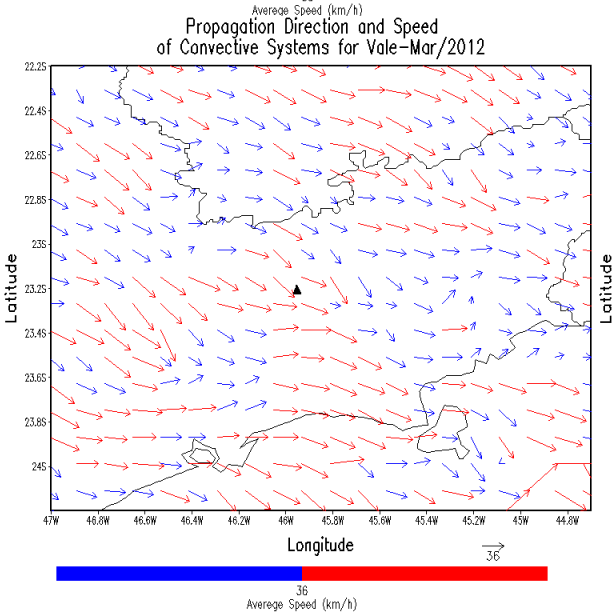
FORTRACC SATELLITE

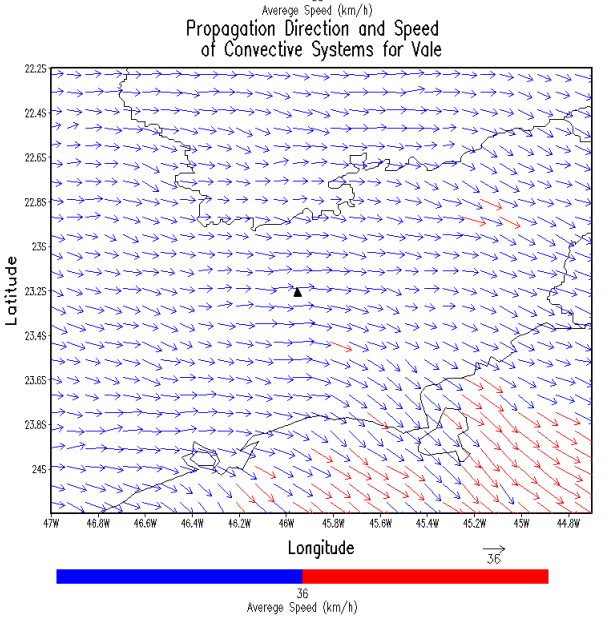






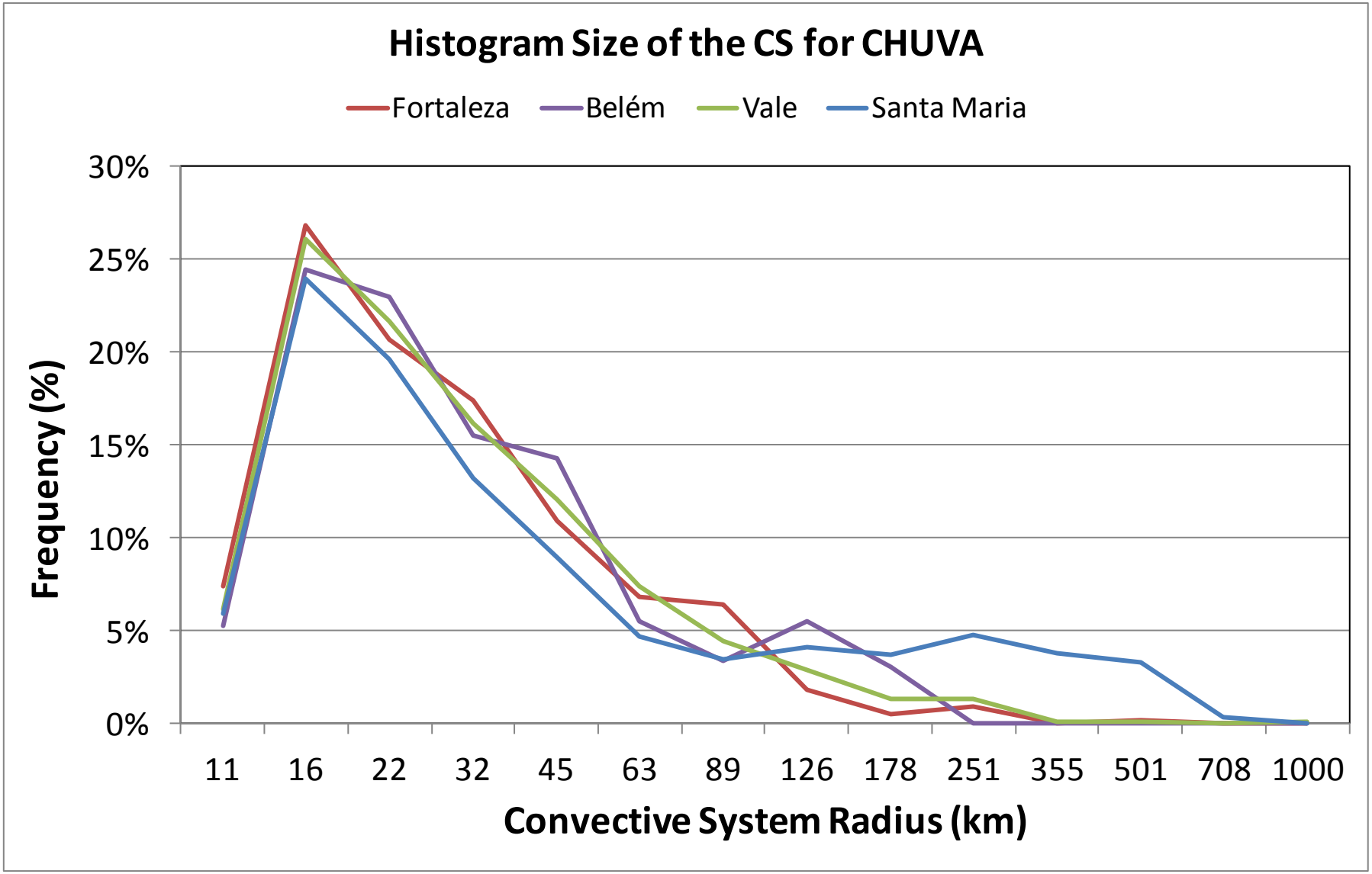






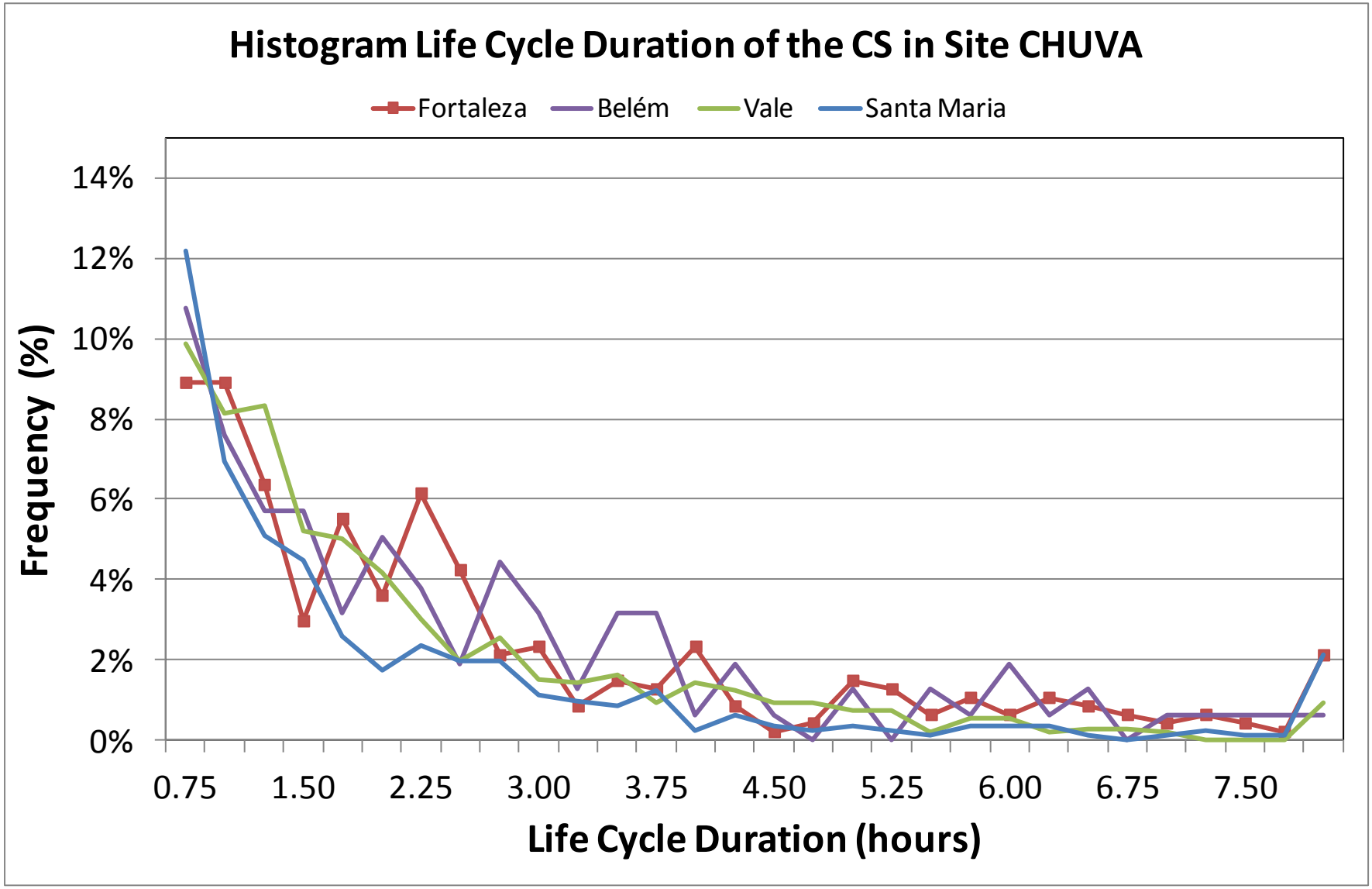
➢ Histogram Size of the Convective System during CHUVA Campaigns

FORTRACC SATELLITE



➢ Histogram Life Cycle Duration of the Convective System during CHUVA Campaigns

FORTRACC SATELLITE



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.;

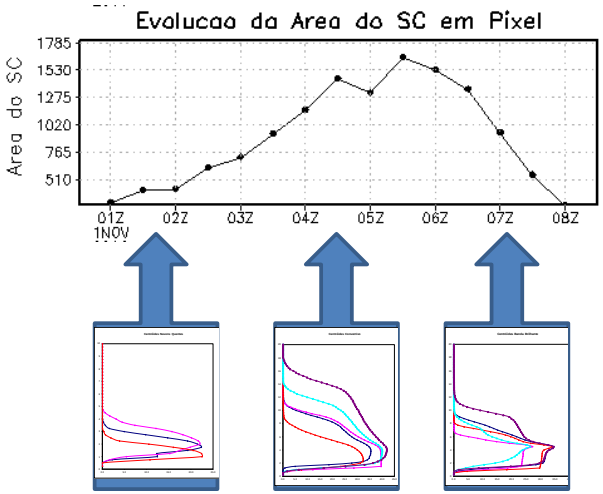
✓The Life Time durations are also very close among all regions.

✓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;

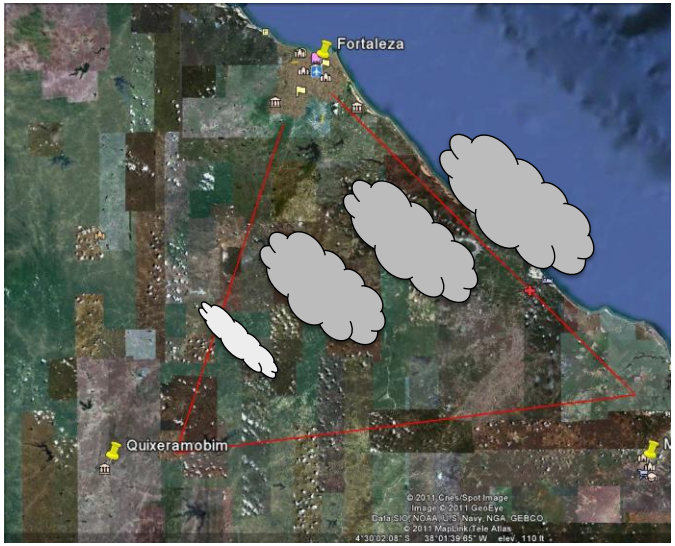
✓Reflectivity profiles as function of the Life Cycle – Regional differences;



- **Radar Banda-X :**
  - ✓ **Zdr;**
  - ✓ **R(dBZ);**
  - ✓ **Kdp;**
- **Fortracc – Radar :**
  - ✓ **Cappi in 2km;**
  - ✓ **Threshold : Dbz > 1;**
  - ✓ **Size > 100 pixels (4 km²);**

Next Steps

✓ MCS Life cycle and convective cloud cover and theirs relations to the dynamics and thermodynics properties (moisture convergene, upper level divergence, CAPE, CINE, etc.). The regional differences.



- Parameter;
  - ✓ CAPE;
  - ✓ CINE;
  - ✓ Div. Humidity ;
  - ✓ Div. Wind;
- Variables;
  - ✓ Rain;
  - ✓ Clouds Cover;