

# ELECTROSTATIC FIELDS OBSERVED DURING THE CHUVA CAMPAIGN

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Three kinds of sensors was used

- Campbell CS110
- Bolteck EFM-100
- Fieldmill USP/UFMS (non-commercial)

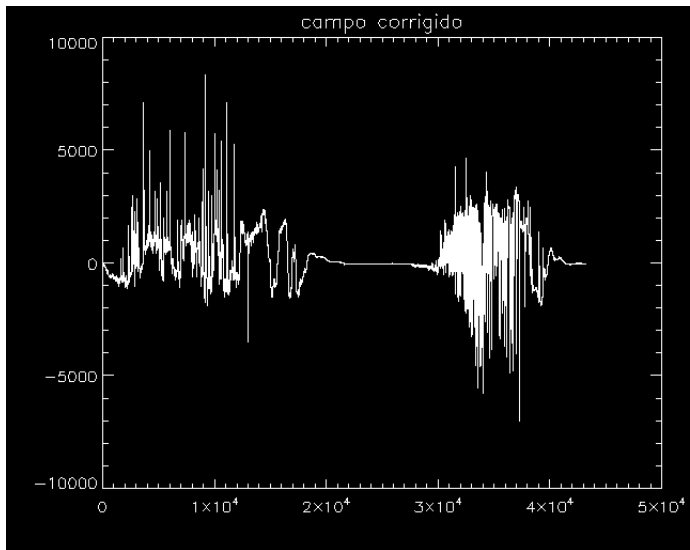




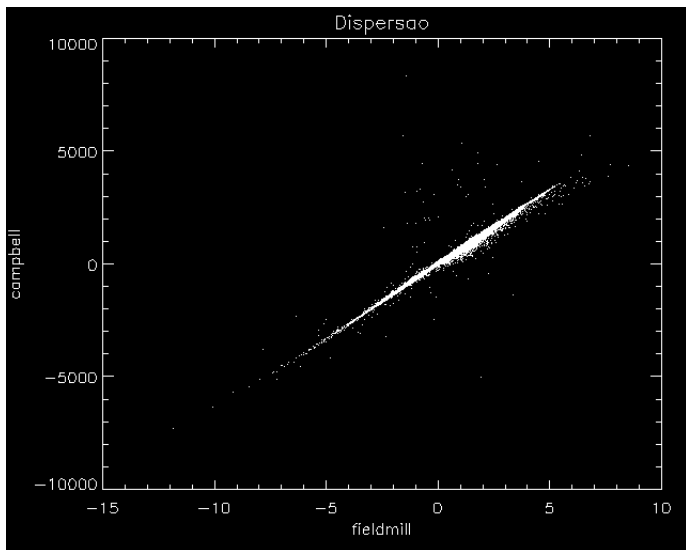
How to ensure that the three different sensors have equivalent measures in V/m during the CHUVA campaign?

For the Campbell CS110 sensor we are using its factory calibration coefficients, while Bolteck EFM-100 and USP-UFMS sensors were calibrated against Campbell CS110 during comparative procedures performed.

# THUNDERSTORMS DAYS FOR COMPARISON

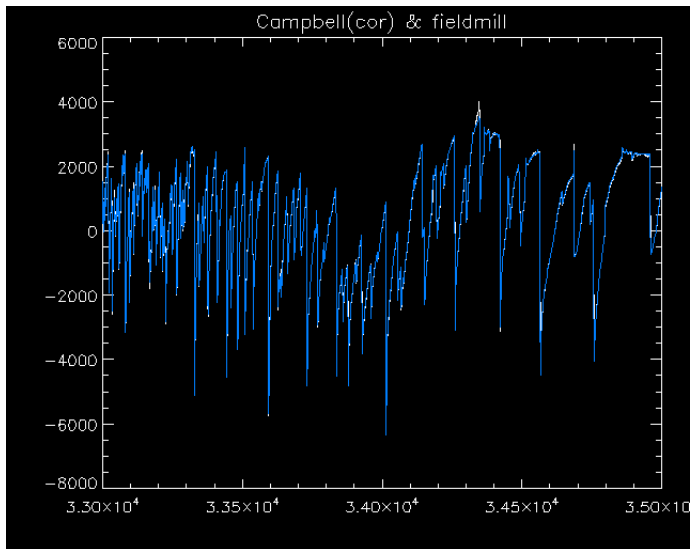


# CAMPBELL VS BOLTECK

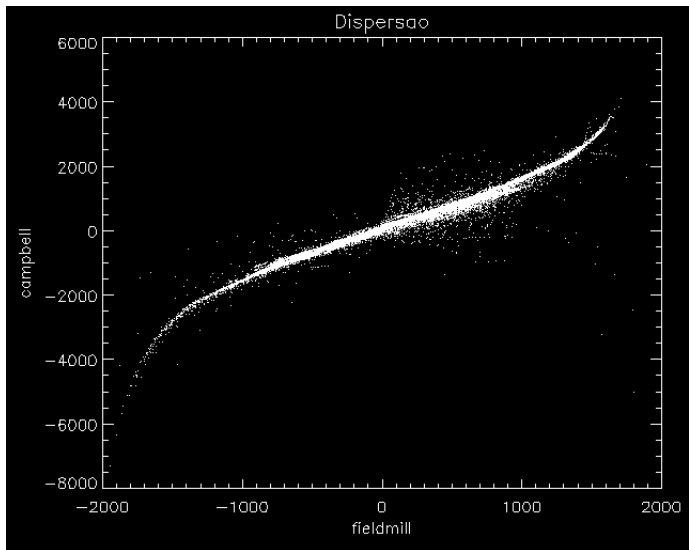




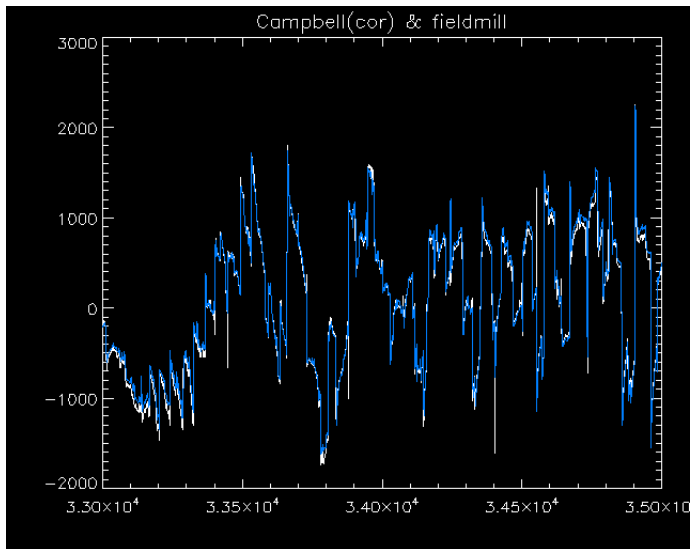
# CAMPBELL VS BOLTECK



# CAMPBELL VS USP/UFMS



# CAMPBELL VS USP/UFMS



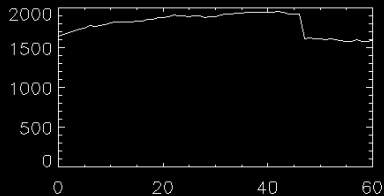
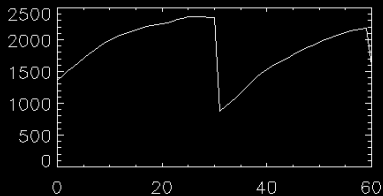
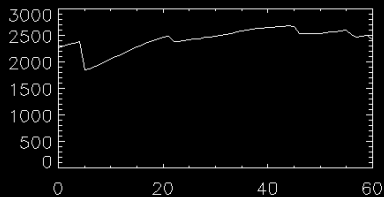
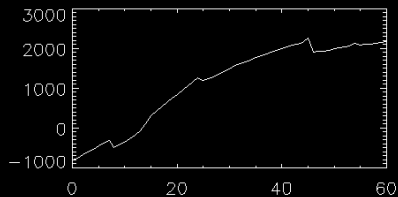
## FIELDMILLS DATA VALIDATION STATUS

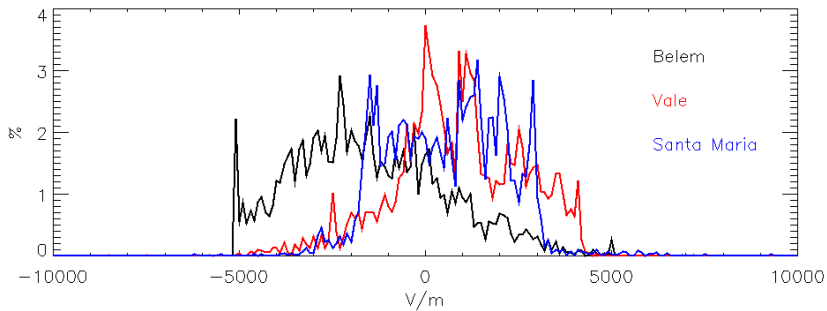
campaing	site	level 0	level 1	level 2
Belém	Aeroporto	OK	OK	OK
	Outeiro	OK	OK	OK
	Benevides	OK	OK	OK
Vale do Paraíba	Aeroporto	OK	OK	OK
	Binfa	OK	OK	OK
	Pequenópolis	OK	OK	OK
	Meteorologia	OK	OK	OK
	Nova dutra	OK	OK	OK
	IEAV	OK	OK	OK
	IAG	OK	OK	OK
Santa Maria	CRS-INPE	OK	no	OK
	Geotérmico	OK	no	OK
	Ed. Física	OK	no	OK
	Jd. Botânico	OK	no	OK
	Fitotecnia	OK	no	OK

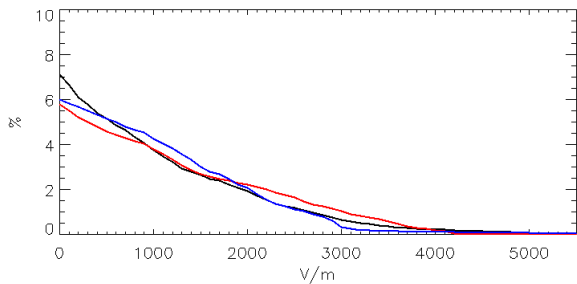
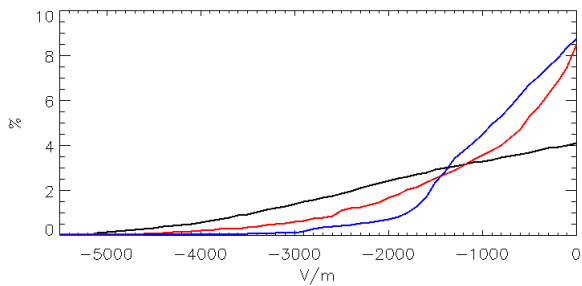
After the comparison process we can show the electric fields observed in campaigns:

- Belém
- Vale do Paraíba
- Santa Maria

## 60 seconds before the lightning activity





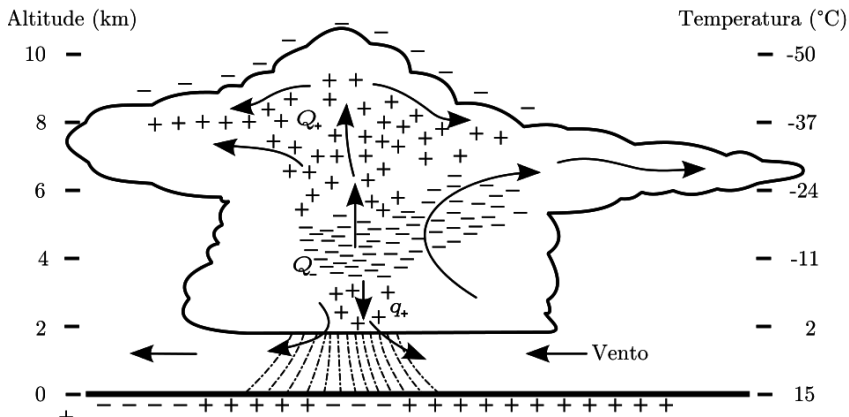


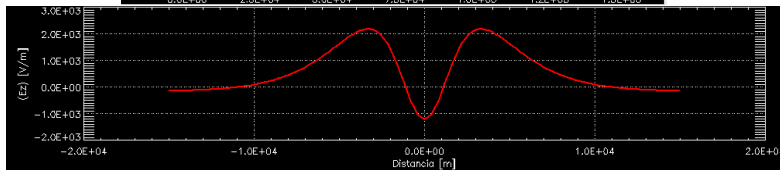
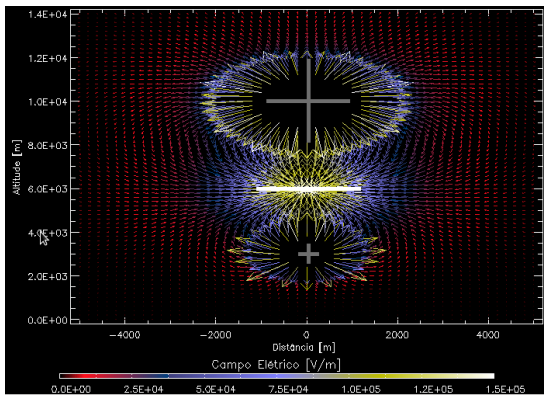


Base on radar data for Fortaleza and Belém indicate echotops between 14-15 km in comparison to VALE-GLM  $<12$  km .<sup>1</sup>

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<sup>1</sup>Morales , M. Lacerda , E. Anselmo , J. R. Neves , R. Albrecht. Understanding the eletrification process.  
ICCP-2012





- The level 2 data validation was concluded after the comparisons between all electric fieldmills over a huge thunderstorms in São Paulo.
- The Belém measures indicates a positive charge center on the cloud base more charged then Vale and Santa Maria.

Log Book Chuva Sul

<http://www.stixy.com/guest/245102>

(<http://chuvaproject.cptec.inpe.br>)

Storm-T web site

<http://www.storm-t.iag.usp.br/blog/>