

# The AFINSA network: presentation and first results

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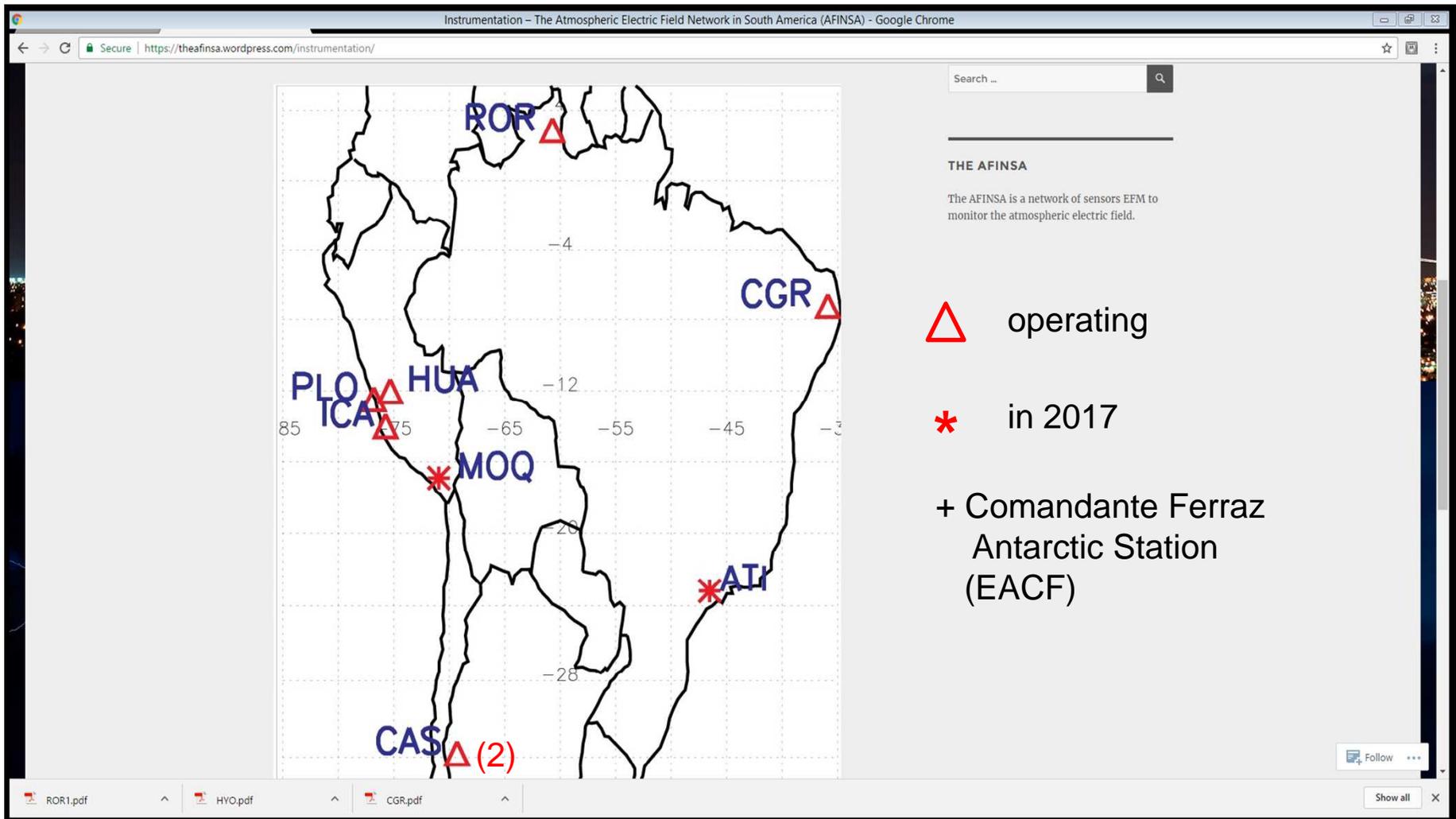
https://theafinsa.wordpress.com/

The screenshot shows a web browser window with the following content:

- Browser title: The Atmospheric Electric Field Network in South America (AFINSA) – The AFINSA is a network of sensors EFM to monitor the atmospheric electric field - Google Chrome
- Address bar: <https://theafinsa.wordpress.com>
- Page content:
  - Two email addresses: [josect1986@gmail.com](mailto:josect1986@gmail.com) and [rauln@craam.mackenzie.br](mailto:rauln@craam.mackenzie.br)
  - Section header: **The Atmospheric Electric Field Network in South America (AFINSA)**
  - Text: The AFINSA is a network of sensors EFM to monitor the atmospheric electric field
  - Navigation menu: About, Objectives, Instrumentation, Data Download, Publications, Financial Support, Collaborators, Contact
  - Image: A wide landscape photograph of a city at night with numerous bright lightning strikes illuminating the dark sky.
  - Section header: **About**
  - Text: The Atmospheric Electric Field (AEF) persists in fair weather regions, without local electrification processes and shows a daily variation with Universal Time independent of where the AEF was measured. This curve is generally known as the Carnegie Curve (Harrison, 2012) and is closely related to the current
  - Search bar: Labeled "SEARCH" with a search input field and a magnifying glass icon.
  - Follow button: A button with a plus icon and the text "Follow".

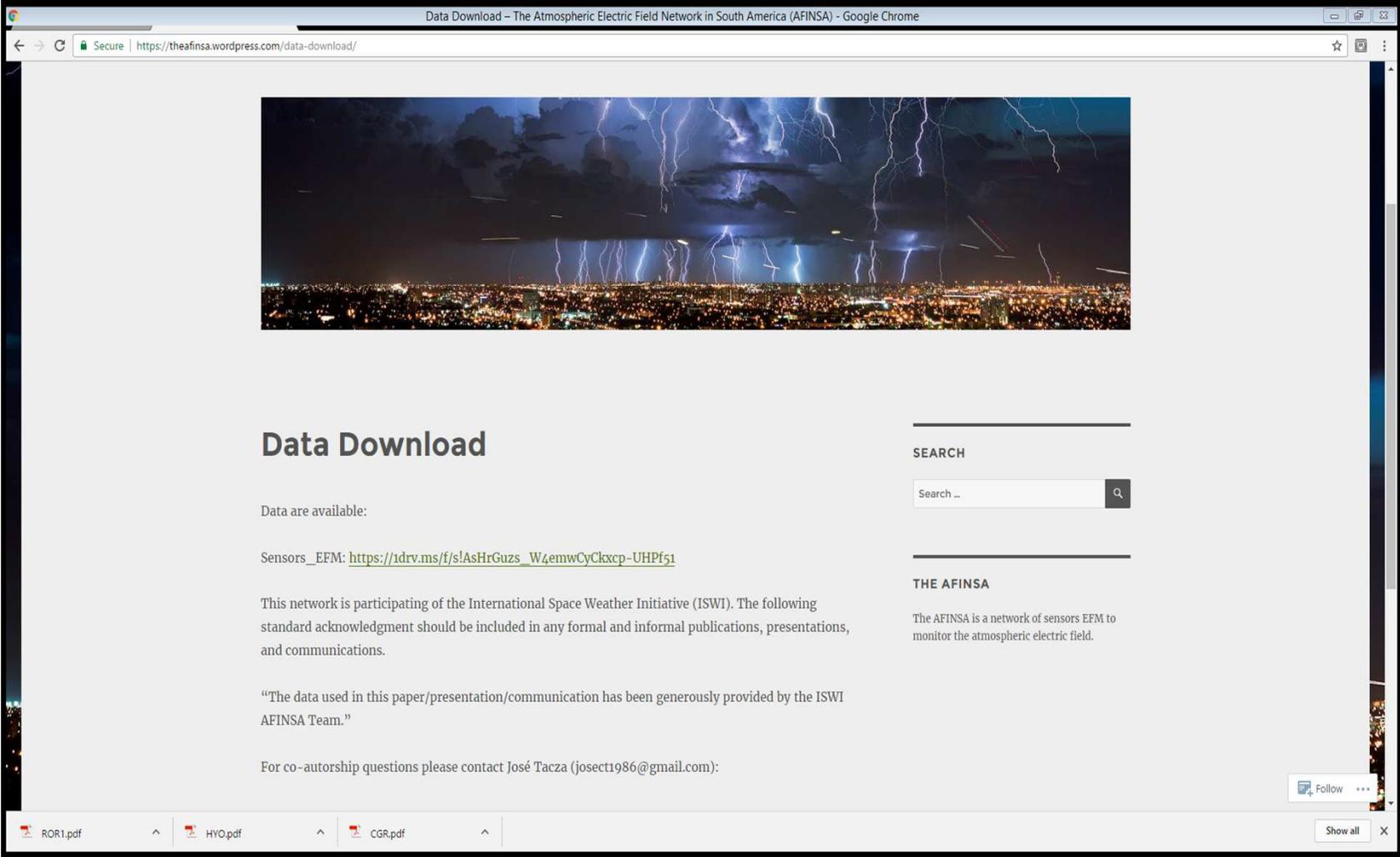
At the bottom of the browser window, there are three open tabs: "ROR1.pdf", "HYO.pdf", and "CGR.pdf". A "Show all" button is visible in the bottom right corner of the browser interface.

# The AFINSA network



[https://1drv.ms/f/s!AsHrGuzs\\_W4emwCyCkxcp-UHPf51](https://1drv.ms/f/s!AsHrGuzs_W4emwCyCkxcp-UHPf51)

EFM station → Year → Month -----> compressed IDLSAVE file



The screenshot shows a web browser window with the following content:

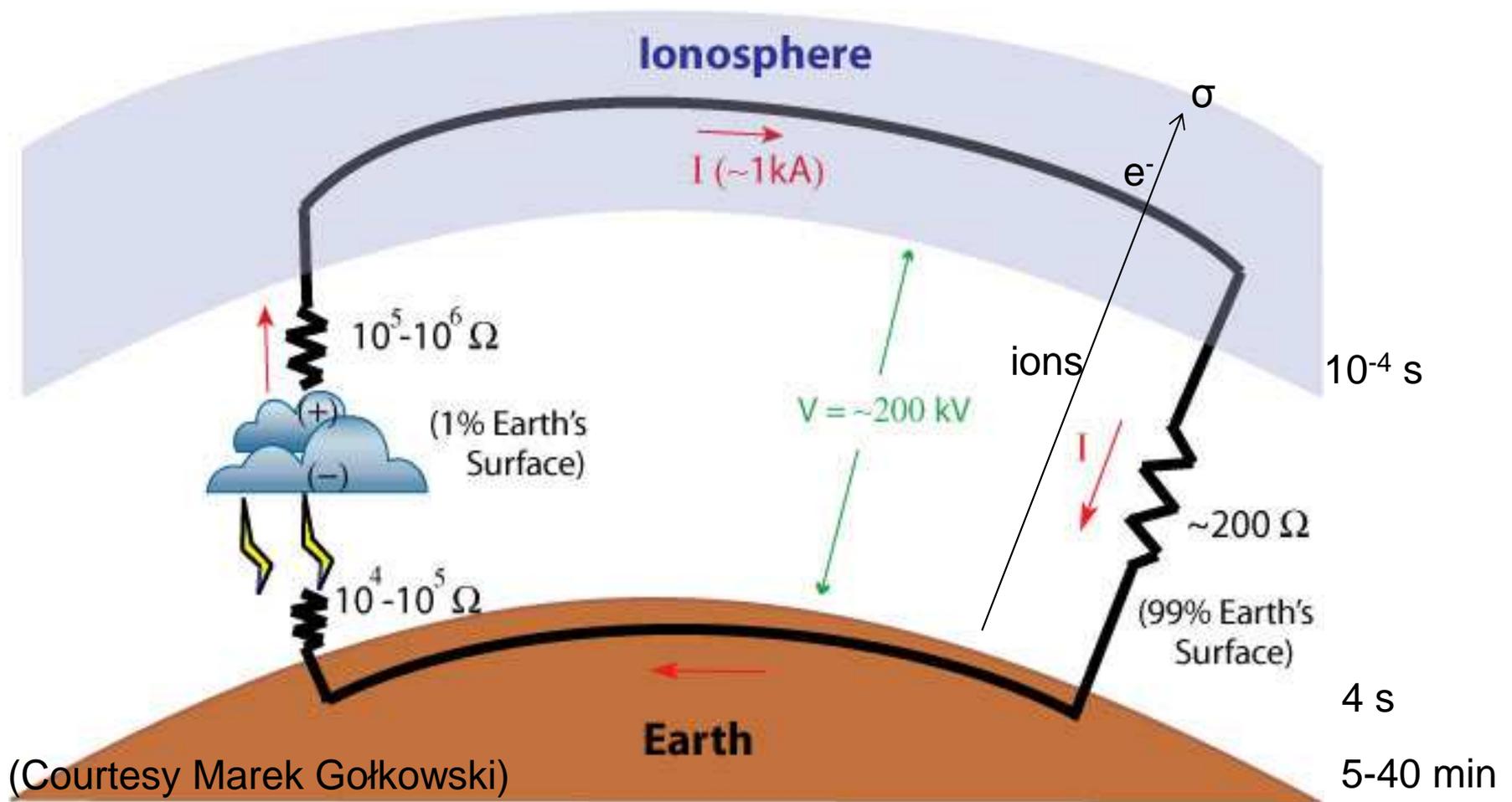
- Page Title:** Data Download – The Atmospheric Electric Field Network in South America (AFINSA) - Google Chrome
- Address Bar:** <https://theafinsa.wordpress.com/data-download/>
- Image:** A wide, horizontal photograph of a city skyline at night, illuminated by lights, with several bright lightning bolts striking the dark sky above.
- Section Header:**

## Data Download
- Text:** Data are available:
- Text:** Sensors \_EFM: [https://1drv.ms/f/s!AsHrGuzs\\_W4emwCyCkxcp-UHPf51](https://1drv.ms/f/s!AsHrGuzs_W4emwCyCkxcp-UHPf51)
- Text:** This network is participating of the International Space Weather Initiative (ISWI). The following standard acknowledgment should be included in any formal and informal publications, presentations, and communications.
- Text:** “The data used in this paper/presentation/communication has been generously provided by the ISWI AFINSA Team.”
- Text:** For co-autorship questions please contact José Tacza ([josect1986@gmail.com](mailto:josect1986@gmail.com)):
- Search Bar:** A search box with the placeholder text "Search ..." and a magnifying glass icon.
- Section Header:**

### THE AFINSA
- Text:** The AFINSA is a network of sensors EFM to monitor the atmospheric electric field.
- Footer:** A "Follow" button with a plus sign and a "Show all" button with an "X" icon.
- Taskbar:** Three open PDF files are visible: ROR1.pdf, HVO.pdf, and CGR.pdf.

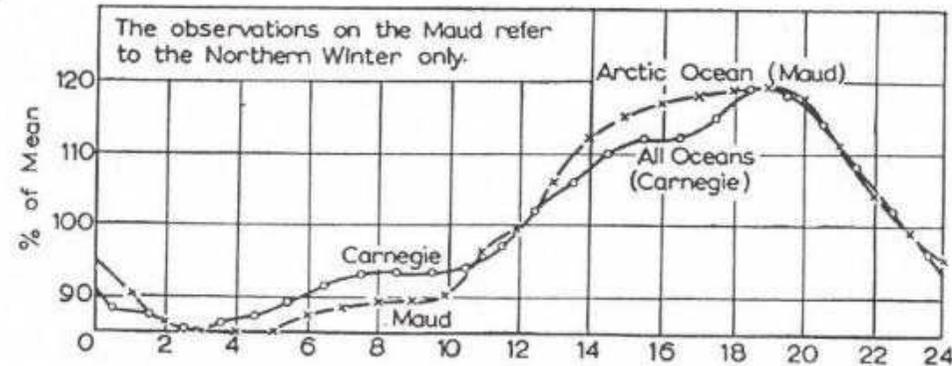
# The Global Atmospheric Electric Circuit

The global atmospheric electrical circuit links charge separation in disturbed weather regions with current flow in fair weather regions

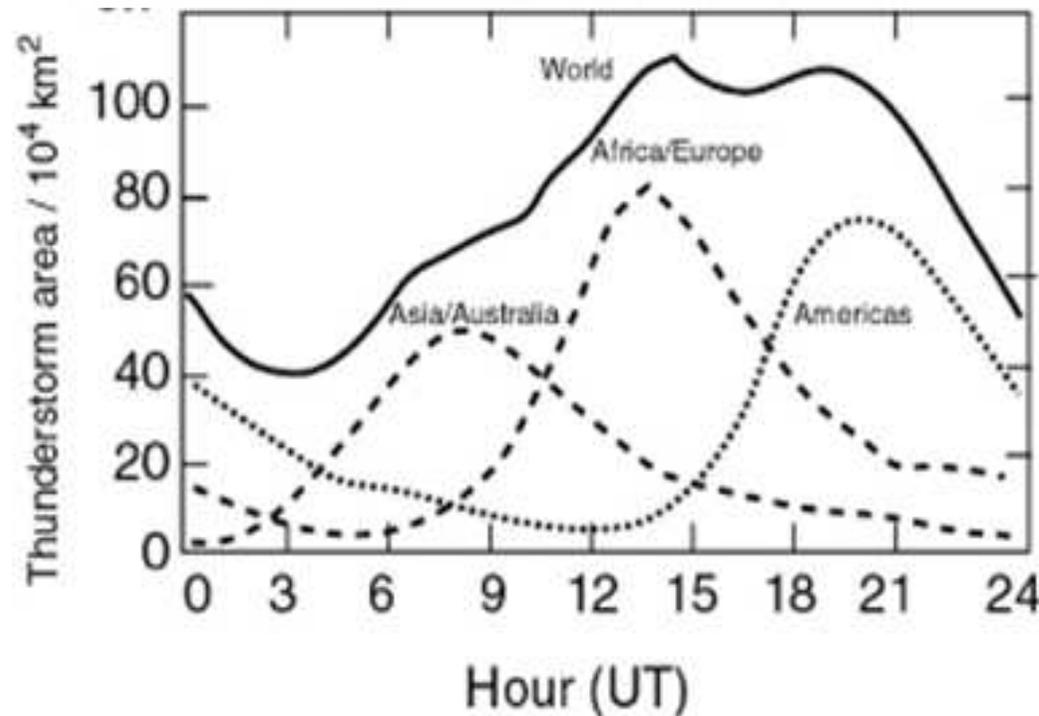


# The Carnegie Curve

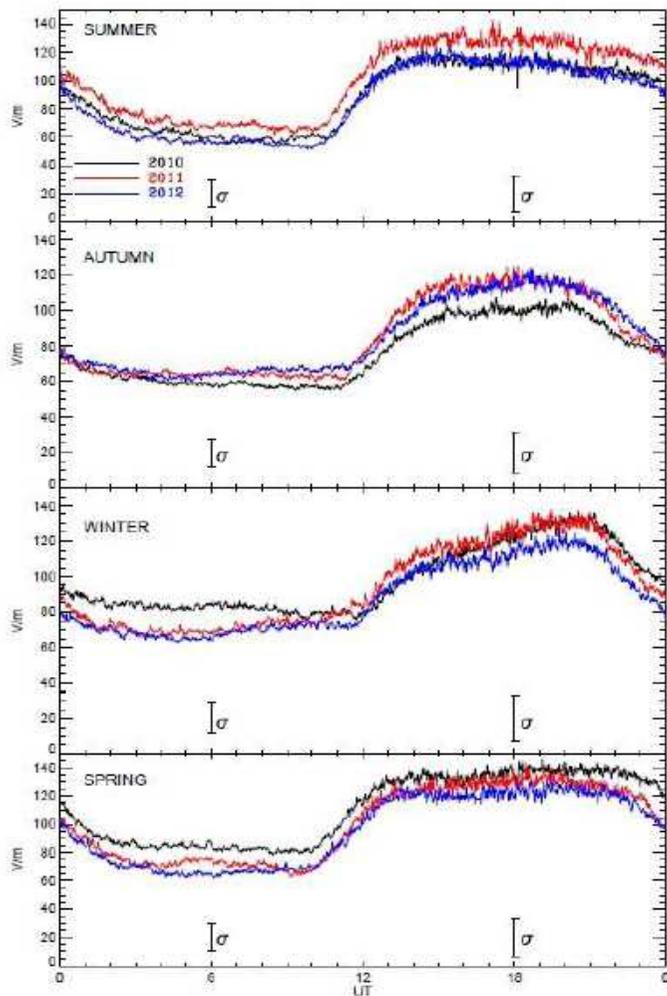
The diurnal variation of the clear weather atmospheric electric field should mimics the global coverage of lightning occurrence curve



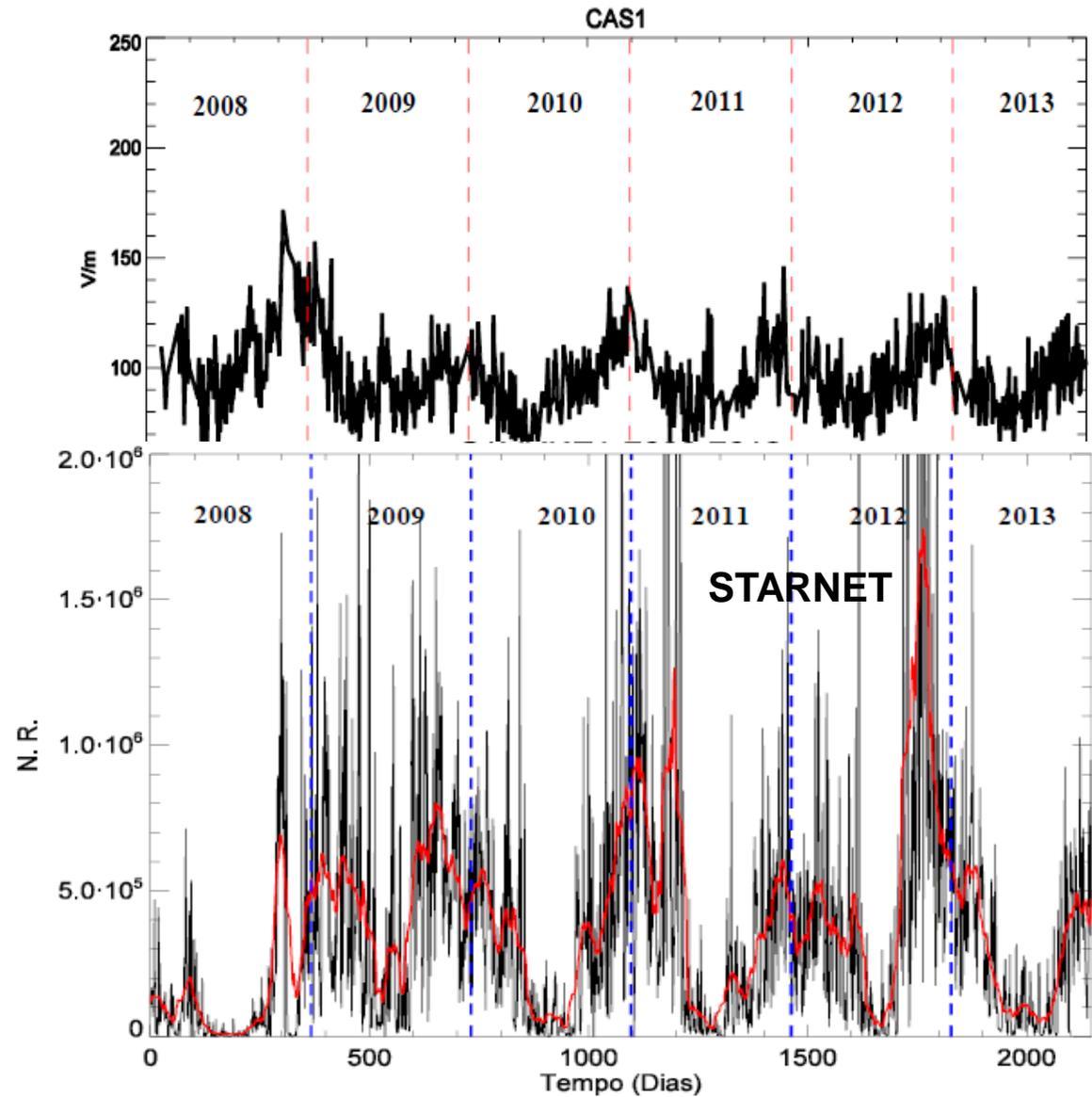
- Carnegie curves
- Departures from Carnegie curves
  - geophysical phenomena
  - seismic activity
  - power supply of the GAEC



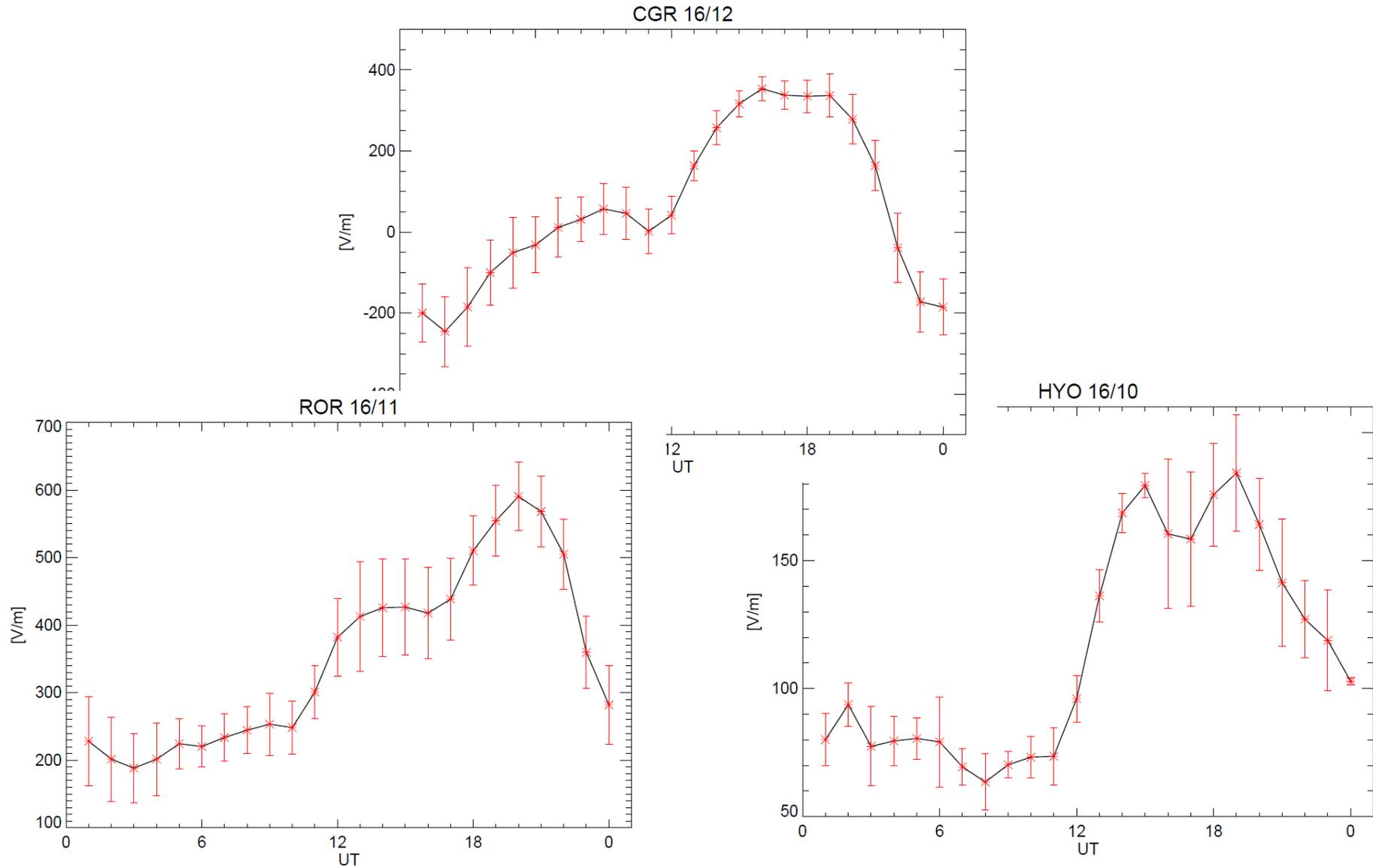
# The AFINSA network



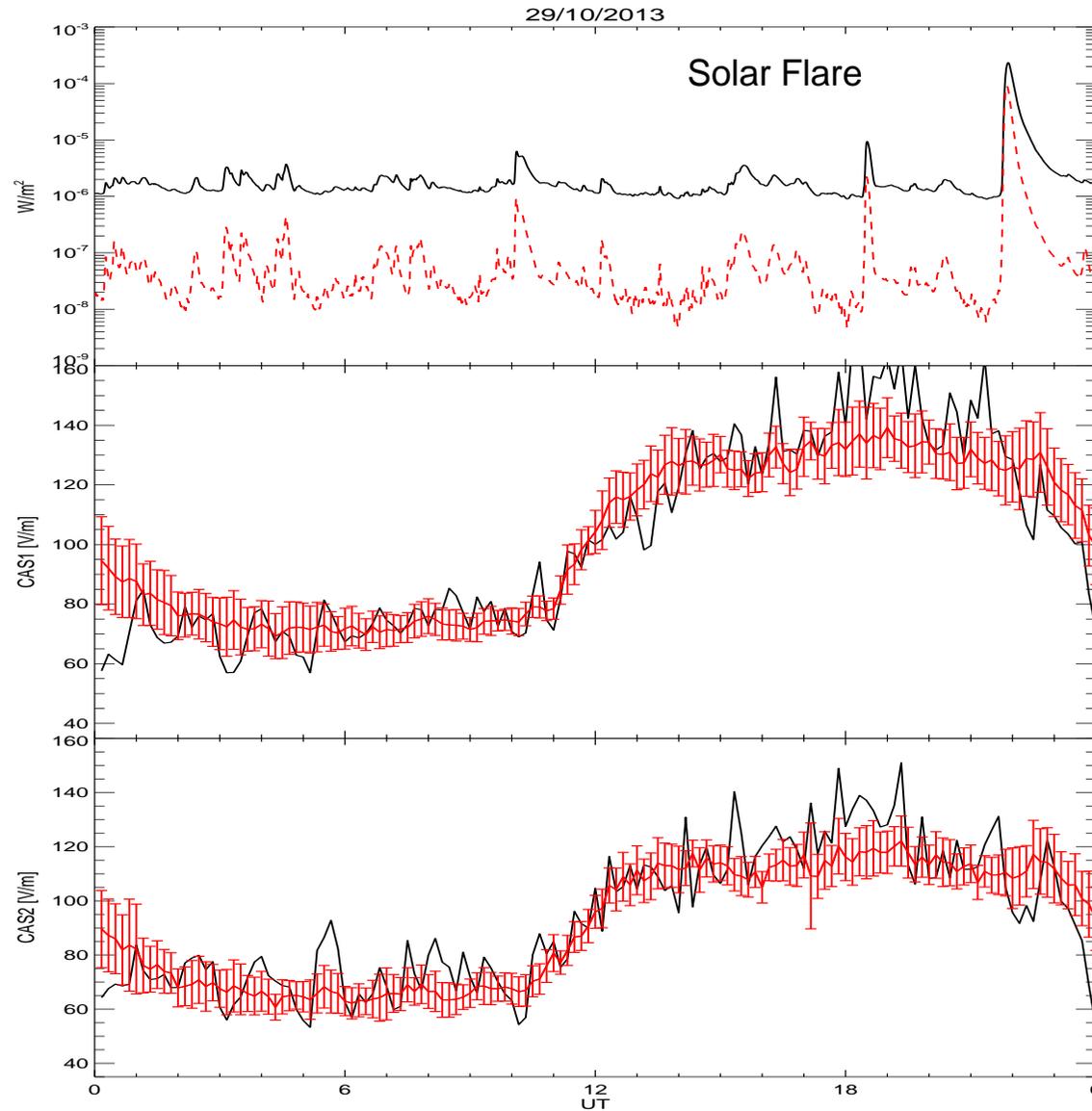
Tacza et al., 2014, JASTP, **120**, 70-79  
[10.1016/j.jastp.2014.09.001](http://dx.doi.org/10.1016/j.jastp.2014.09.001)



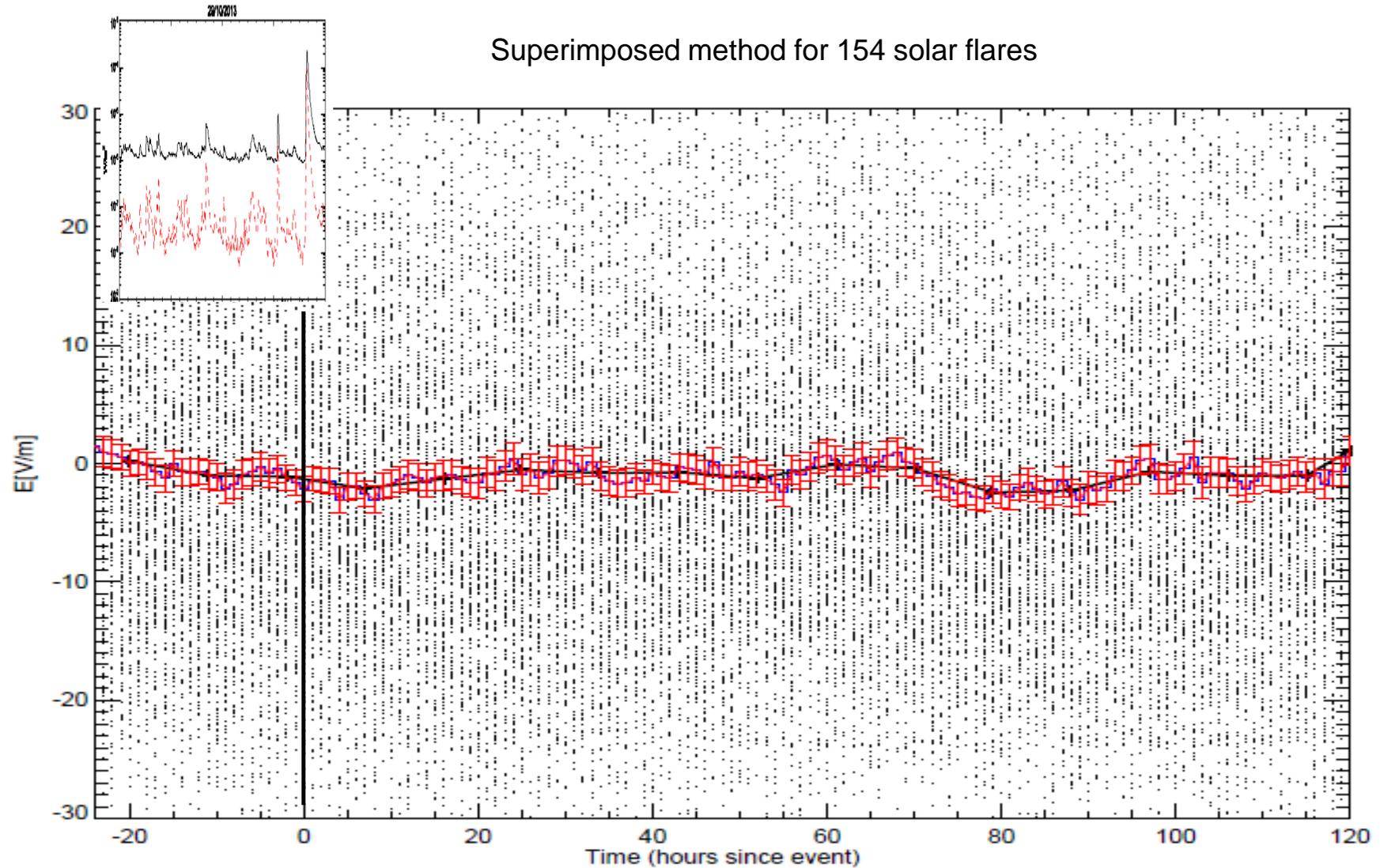
# The AFINSA network



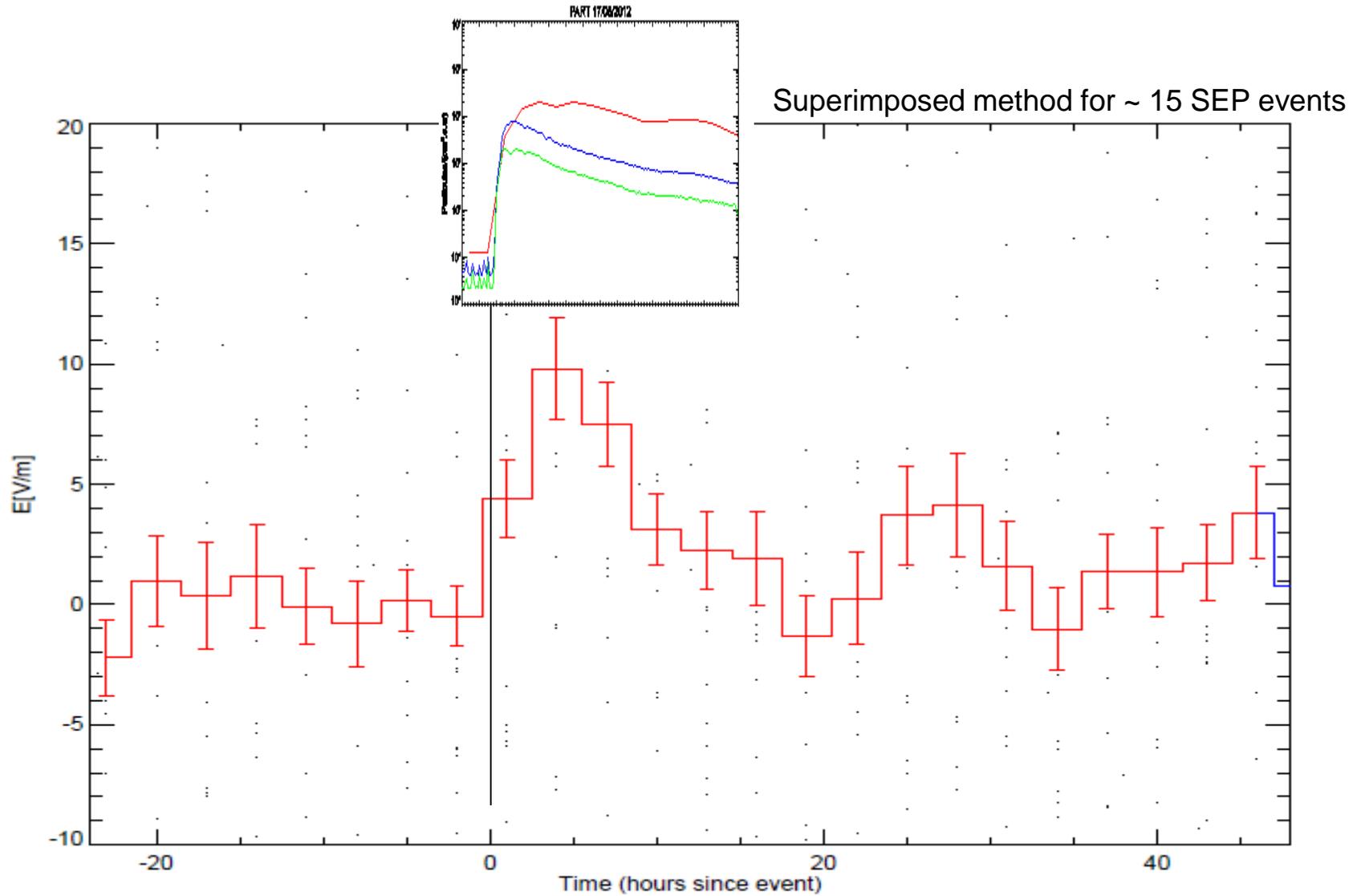
# The AFINSA network



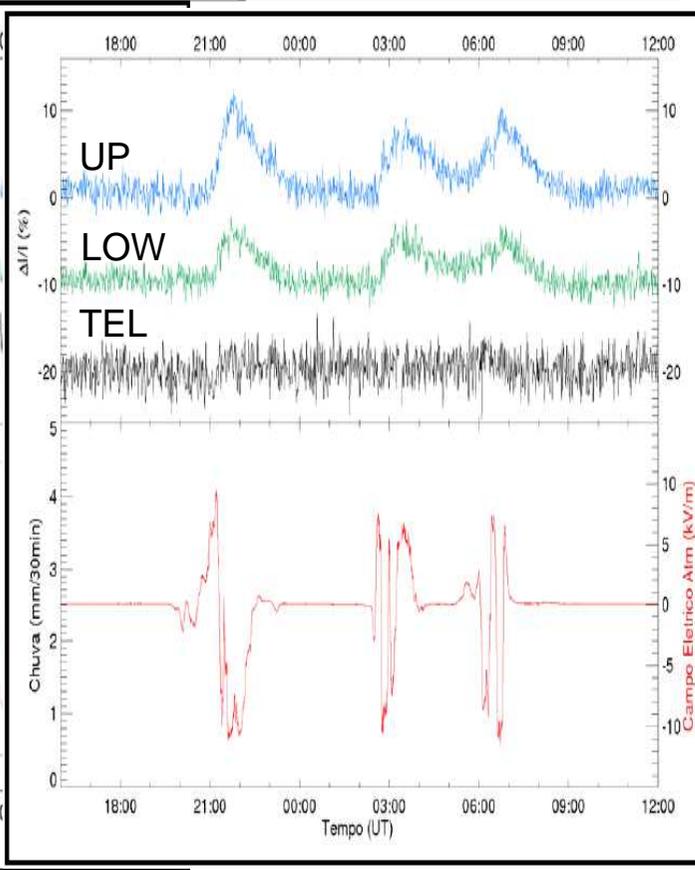
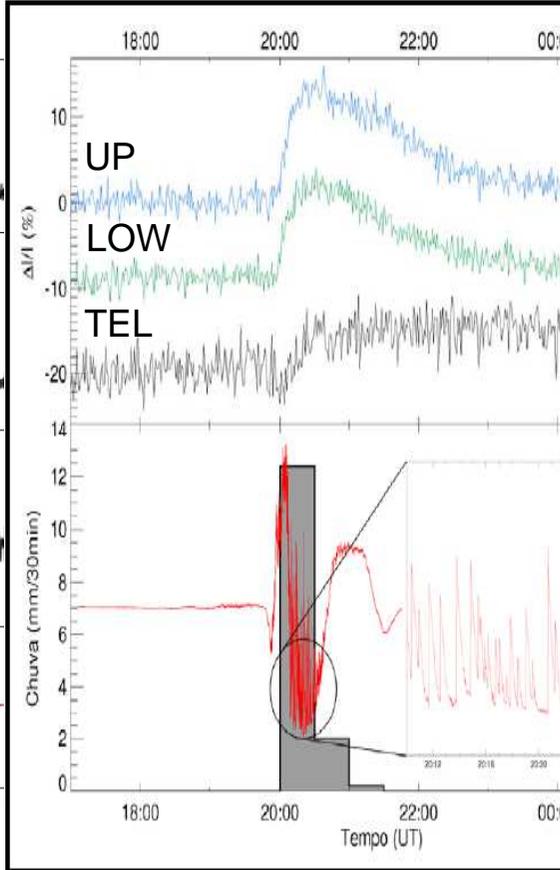
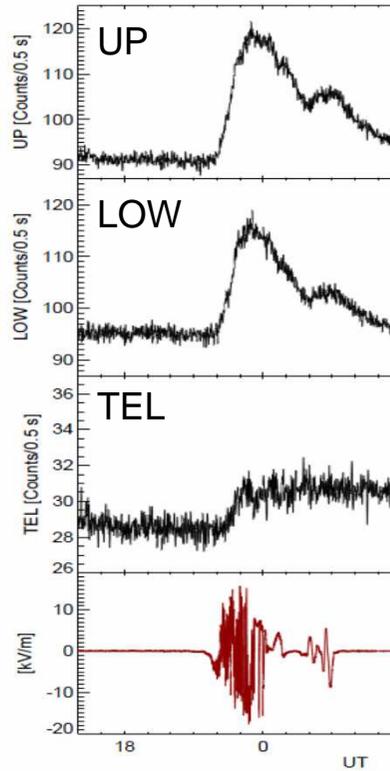
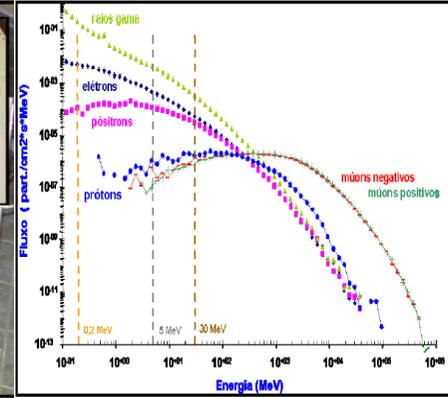
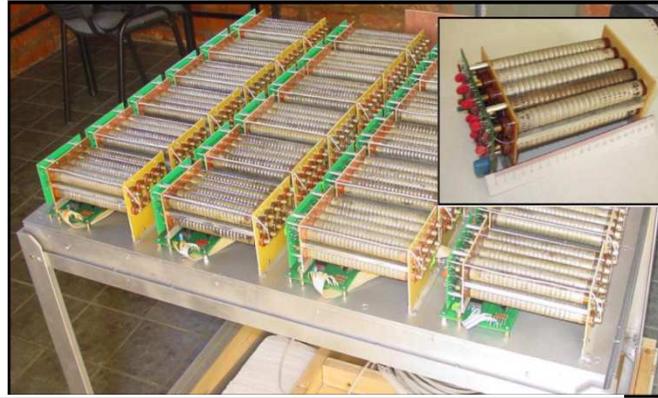
# The AFINSA network



# The AFINSA network



# Charged particle observations at CASLEO

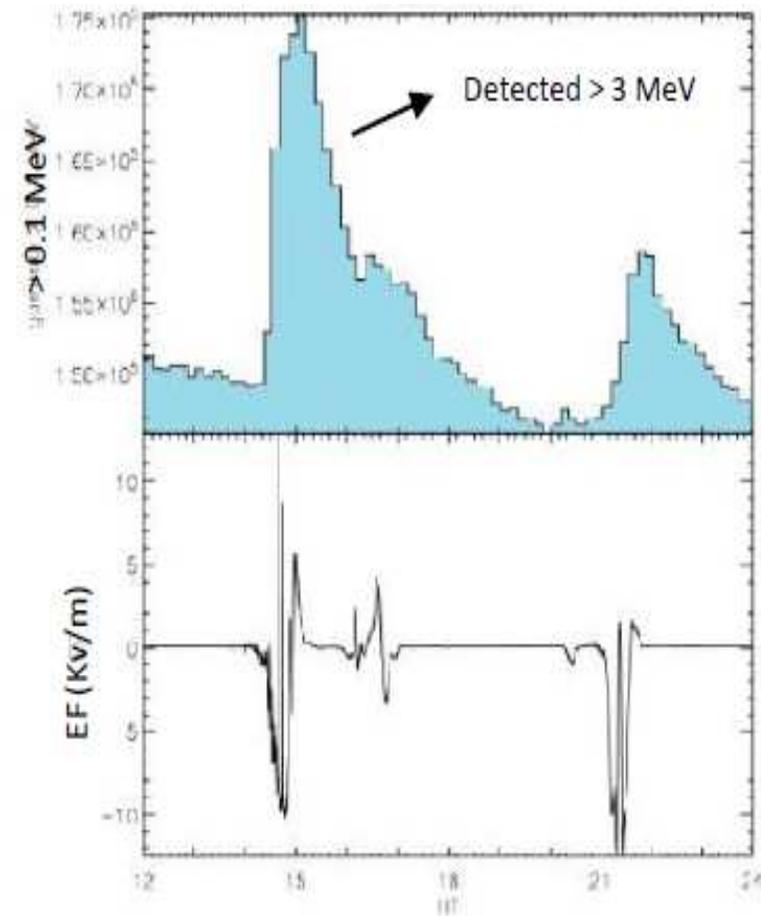
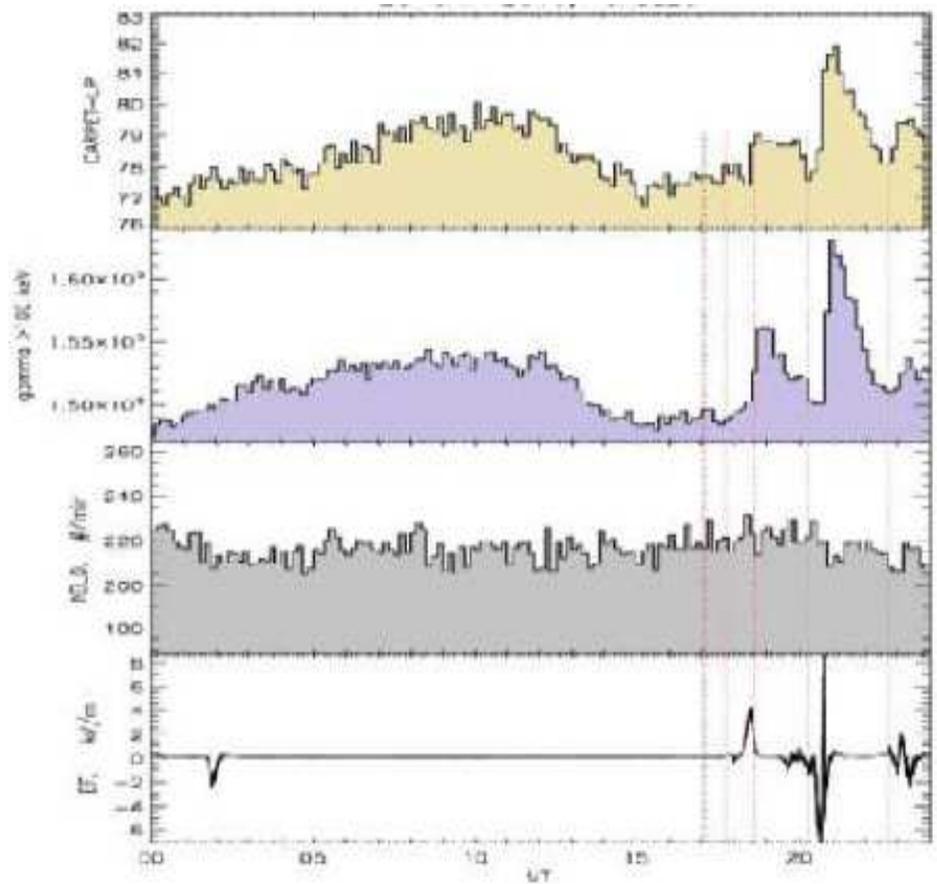


Charged particle acceleration due to few 10s kV/m AEF (Alexeenko, Toropov, Muraki papers).

# Neutrons and X/ $\gamma$ -rays observations at CASLEO



# Neutrons and X/ $\gamma$ -rays observations at CASLEO



## CONCLUSIONS

The Atmospheric electric Field IN South America (AFINSA) monitoring network is composed of 7 field mill sensors in 6 different stations (Brazil, Peru and Argentina), as of 2016. The first station is operating since 2008. Three stations are located above SL (2550 m (2), 3330 m). Extension of AFINSA in 2017: ATI (SL), MOQ (4500 m asl), EACF (SL).

Data are available at the AFINSA web site. Data format ? ,  $f(t)$  ?, FW curves ?

24-hours FW curves are obtained from (weekly, monthly) means, and are stable in time, although different comparing altitude and SL record stations.

Therefore, geophysical disturbances and perturbations from below can be studied.

Comparison with other diagnostics (charged particles, HXR/ $\gamma$ -rays, neutrons) simultaneously observed with the FW-AEF can bring new clues on high-energy atmospheric processes.