

# CLUSTER

$N_e$  vs ScP

Arnaud Masson

Research and Scientific Support Department, ESTEC, European Space Agency

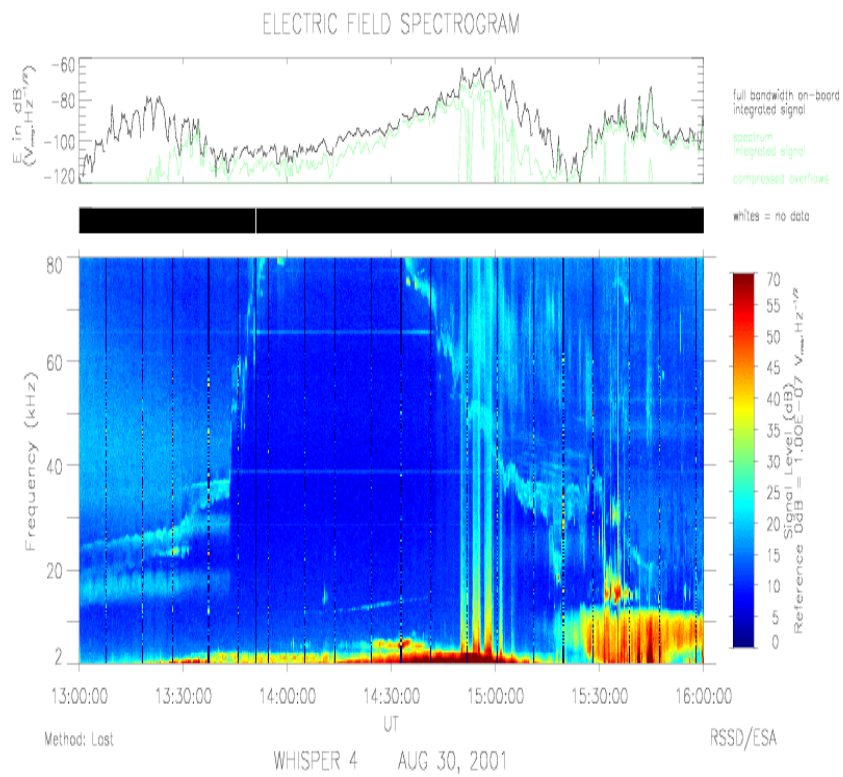
---

1. Goal
  2. Active sounding approach
  3. Passive measurements approach
  4. Empirical law and statistical approach
  5. Validation and future work
- 

Brussels meeting, 24-25 February 2003

# EFW - WHISPER

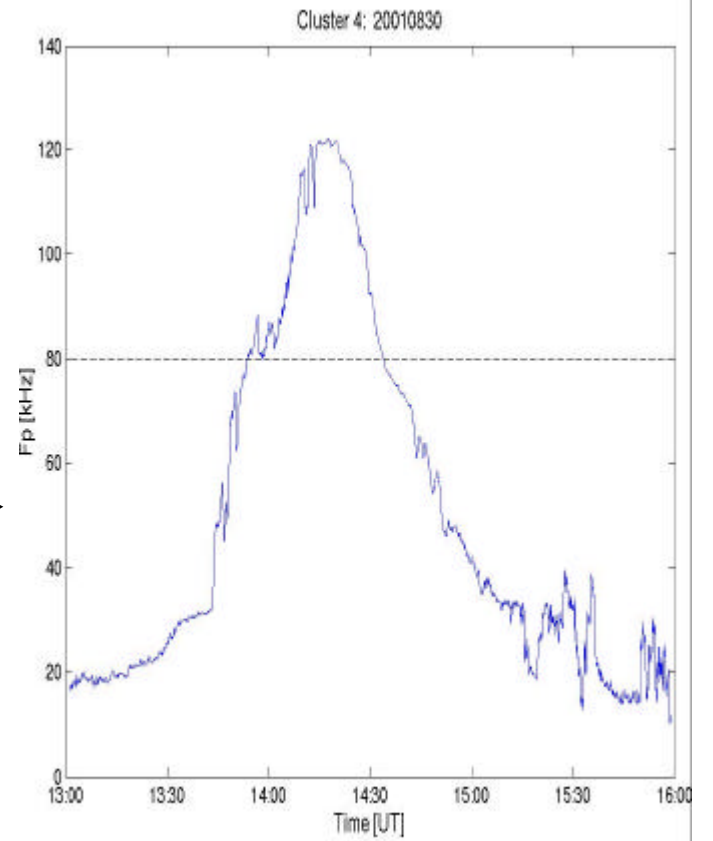
## Example



EFW  
ScP



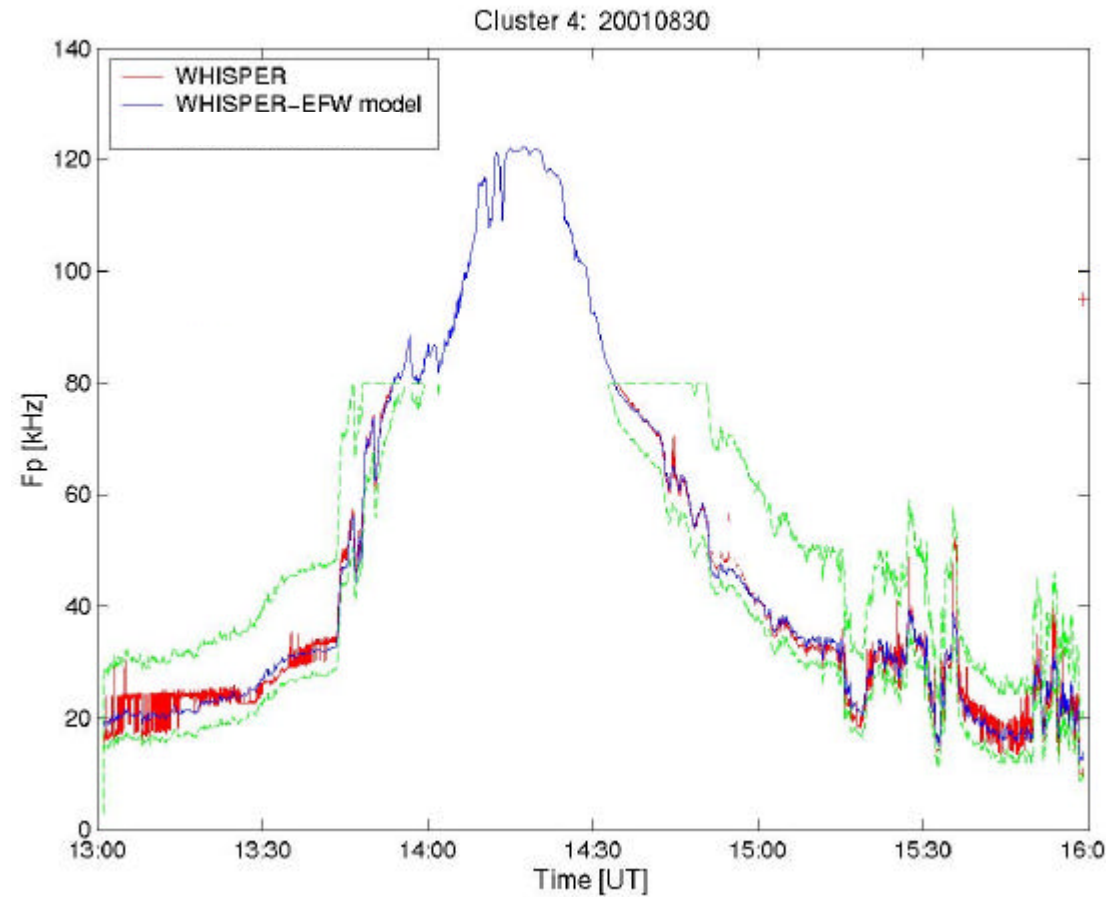
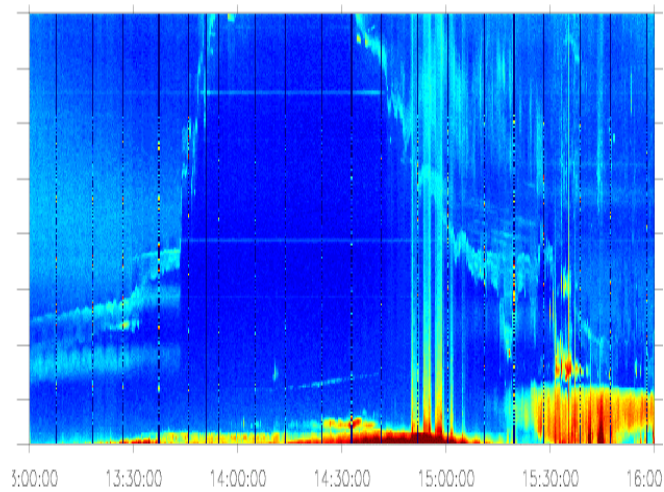
+



# EFW - WHISPER

*“Automatic procedure” ( 1<sup>st</sup> attempt)*

- Low frequency cutoff
- Interferences neglected
- Saturation ignored
- Whole time interval

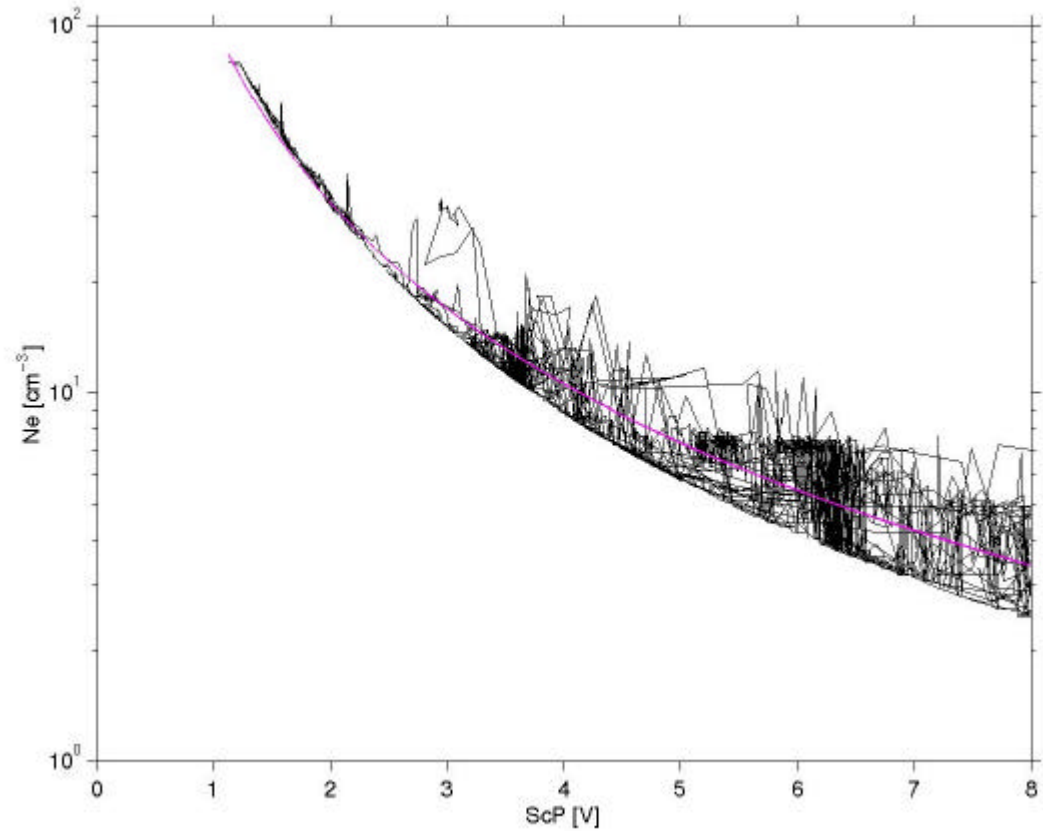


## EFW - WHISPER

*“Automatic procedure” (1 year ago)*

- One power law
- Whole time interval

- Interferences neglected
- Saturation ignored

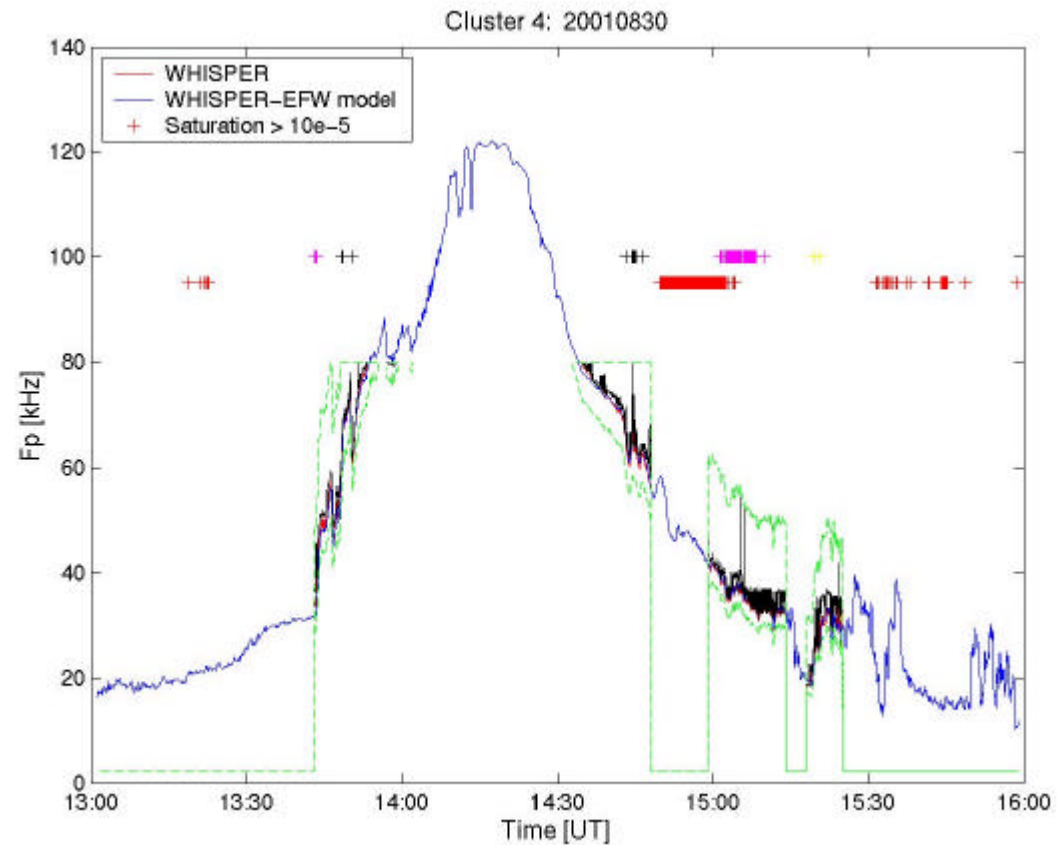


# EFW - WHISPER

*“Automatic procedure” (now)*

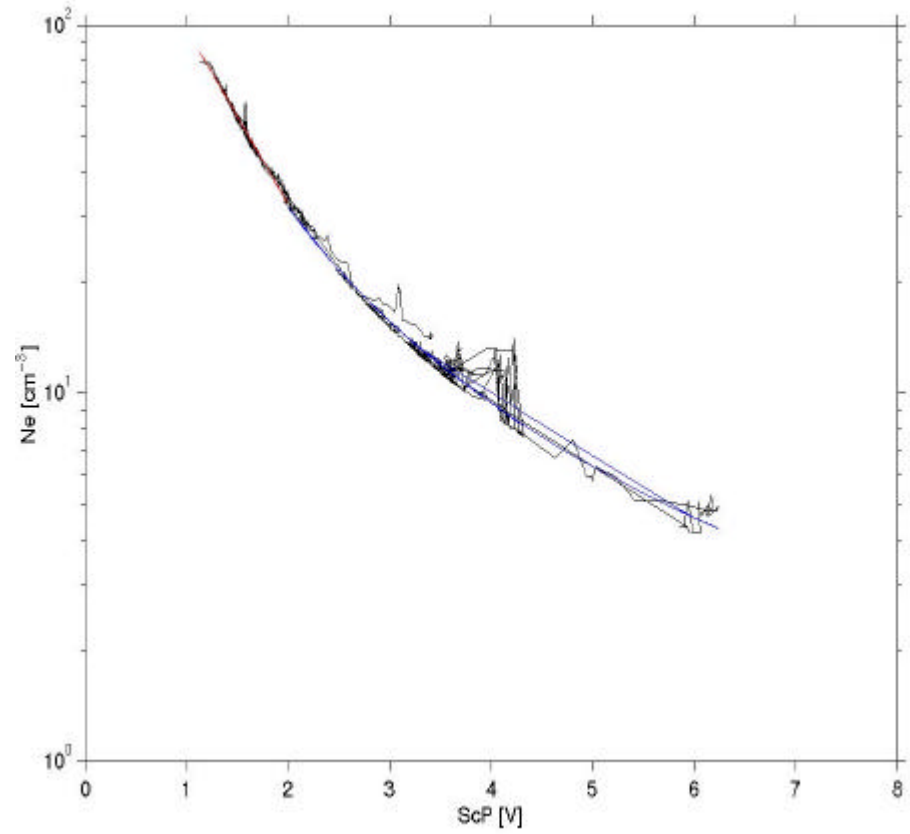
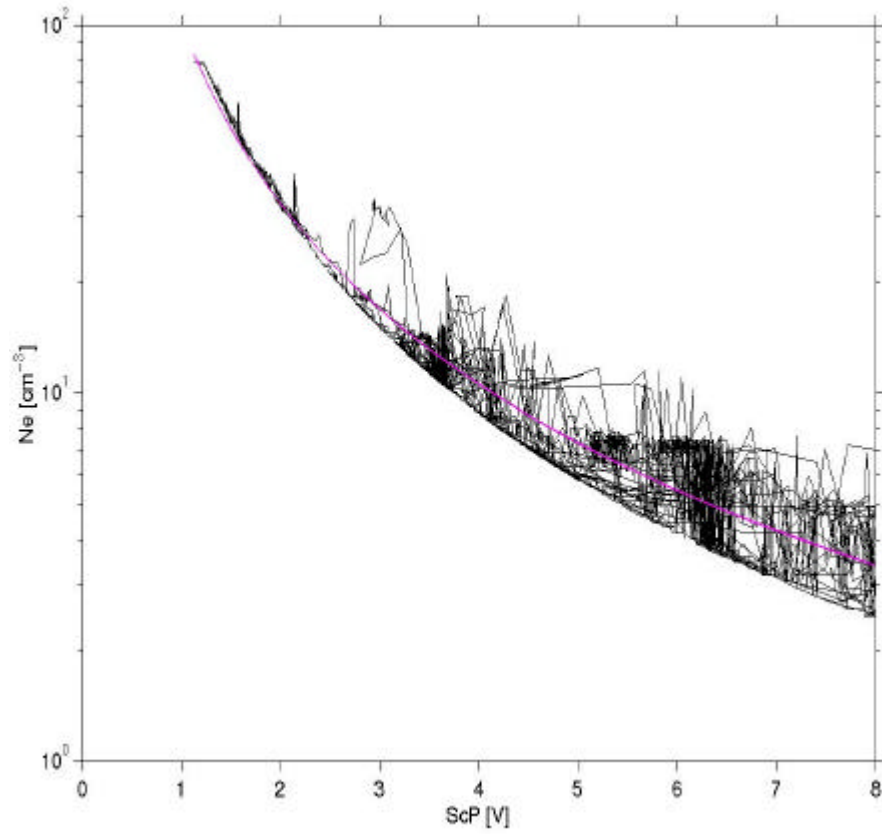
- Two laws
- Chosen time intervals
- Estimation error

- Interferences “treated”
- Saturation detected



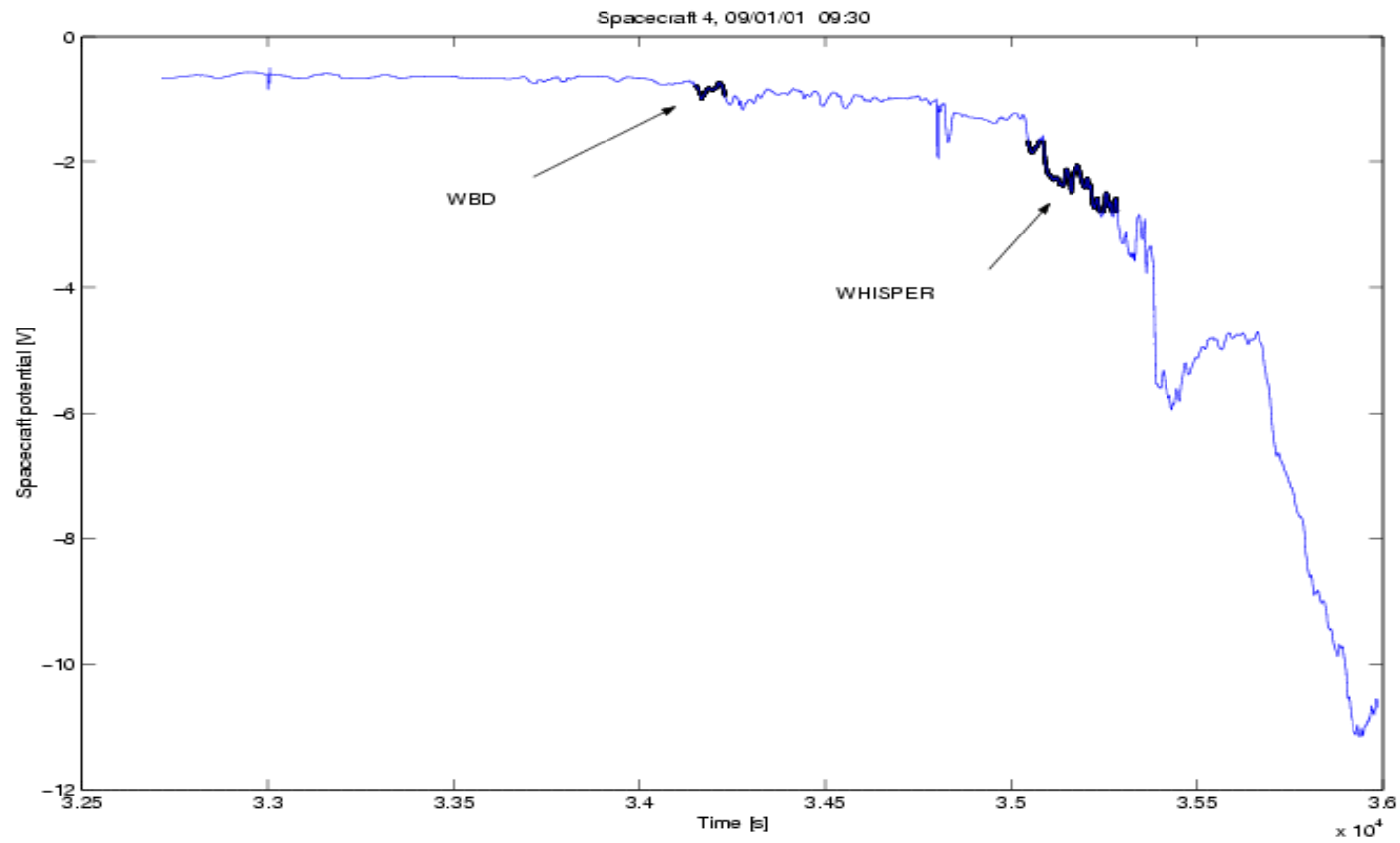
# EFW - WHISPER

*“Automatic procedure” (now)*



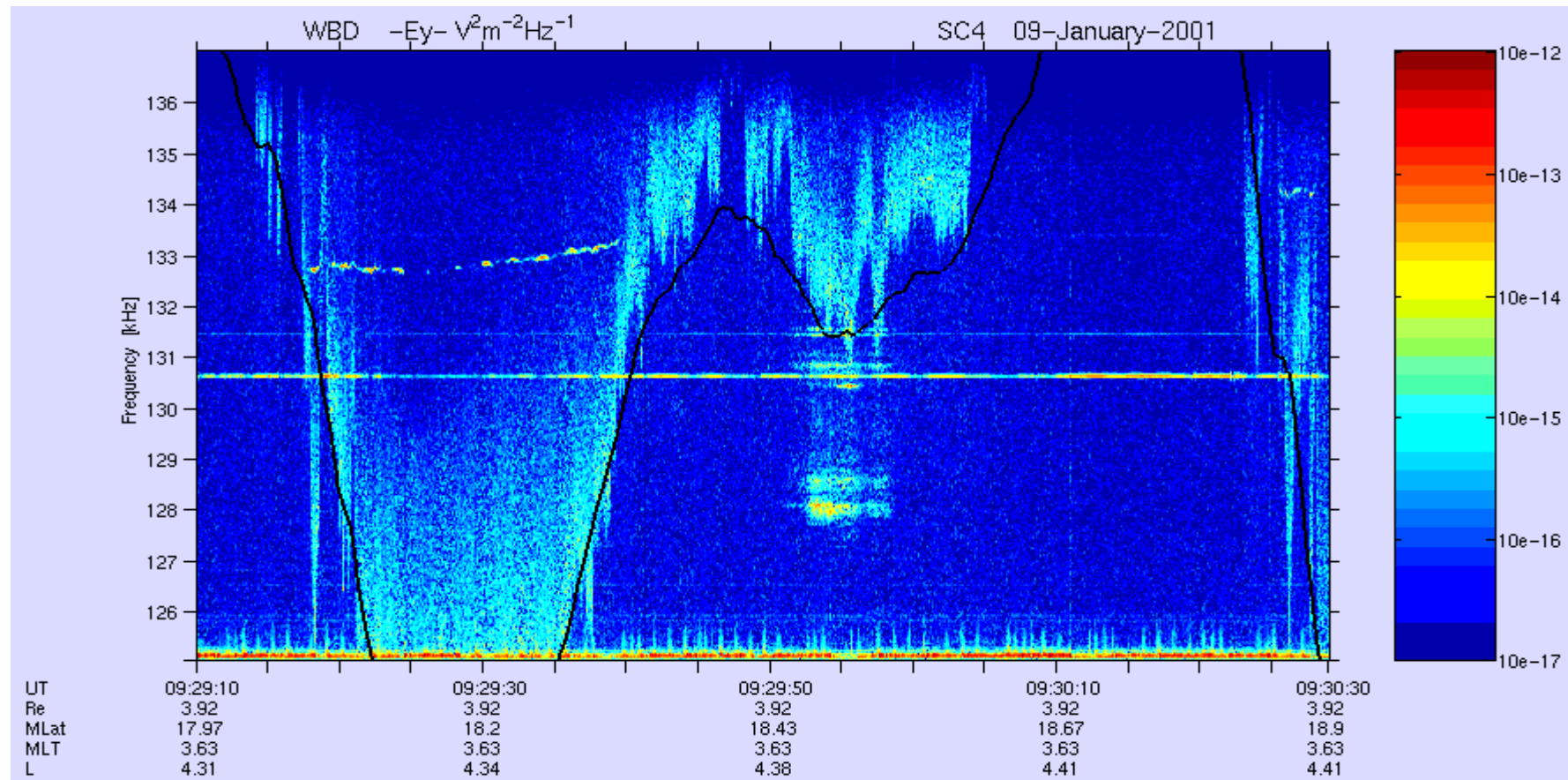
# EFW - WHISPER - WBD

## *Validation*



# EFW - WHISPER - WBD

## *Validation*





## *Future Work*

---

### **More comparisons with data**

- Include electrons and ions measurements: highest priority
- Systematic comparisons with WBD

### **Bias current and satellite aging (EGS 2003)**

Bias current : February-April 2001: p1p2-180nA, p3p4 - 220 nA, May 2001 - 180 nA on all  
June 2001 onwards - 140nA on all

Satellite aging: dependence of the calibration curve through the lifetime of the Cluster mission