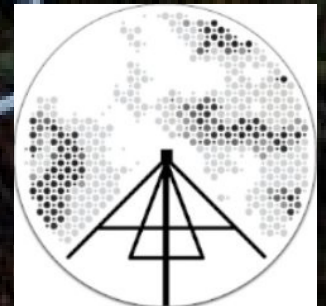


NenuFAR planetary lightning KP (ES06)

J.-M. Griessmeier for the
NenuFAR Planetary Lightning KP
LPC2E & OSUC Orléans
jean-mathias.griessmeier@cnsr-orleans.fr



Outline

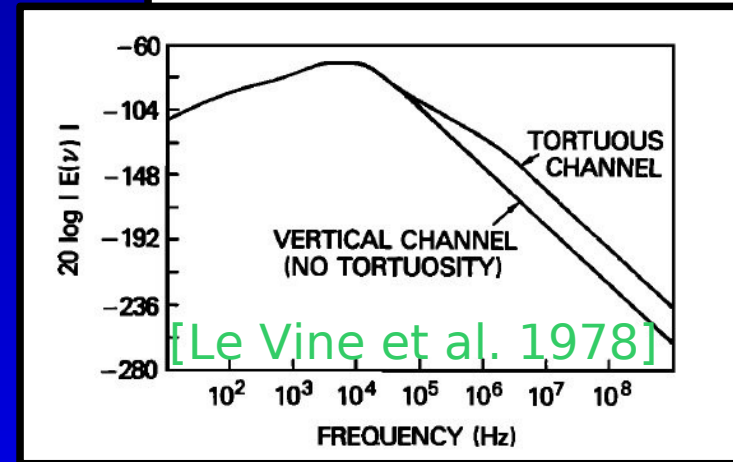
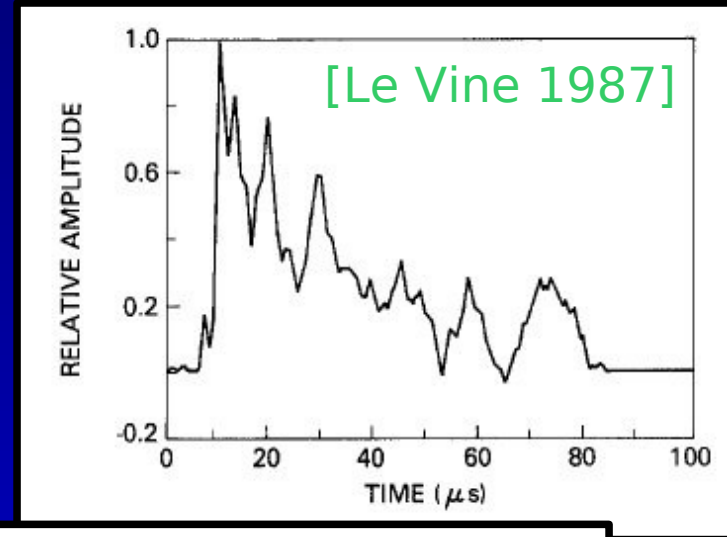
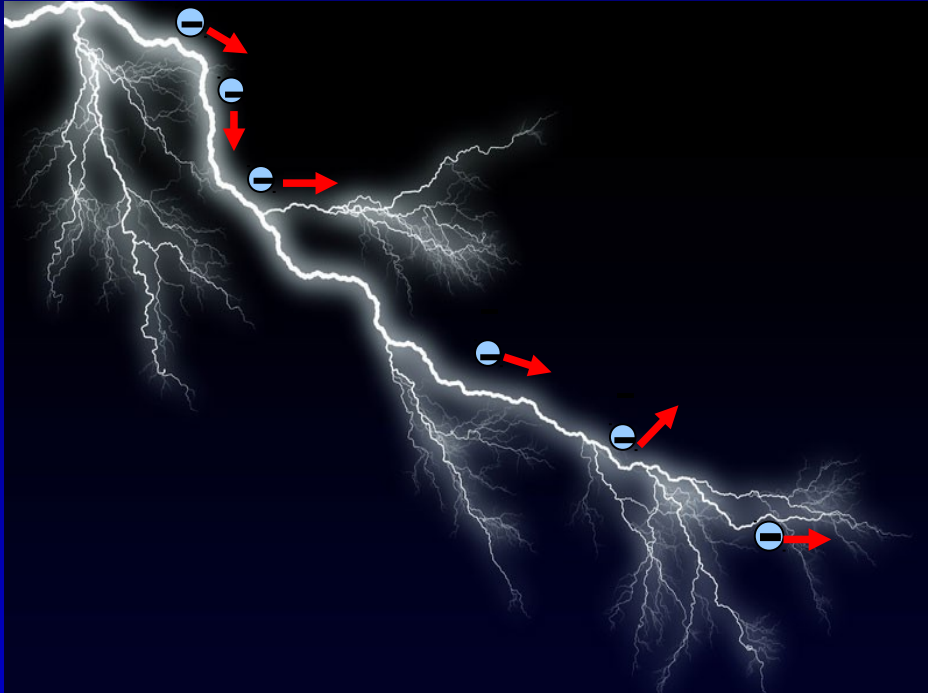
- KP team
- Scientific context
- Observations & data pre-processing

KP Team

- Jean-Mathias Griebmeier (PI)
- Philippe Zarka, Baptiste Cecconi, Sébastien Célestin, Georg Fischer, Laurent Lamy, Jake Turner
- open for new team members!

manpower is limited (all team members involved in multiple projects/NenuFAR KPs)

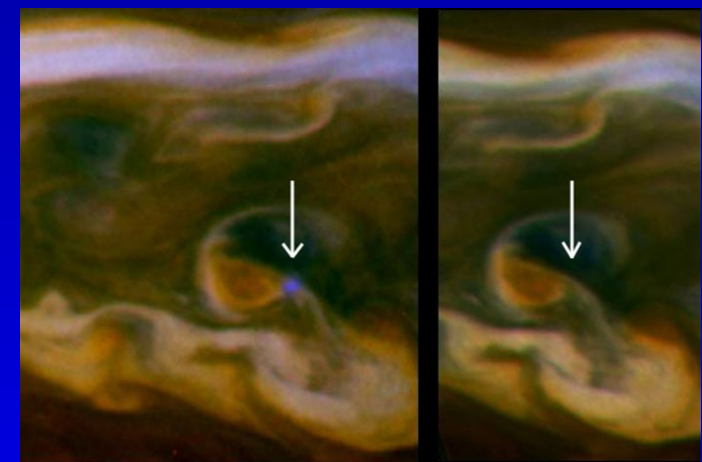
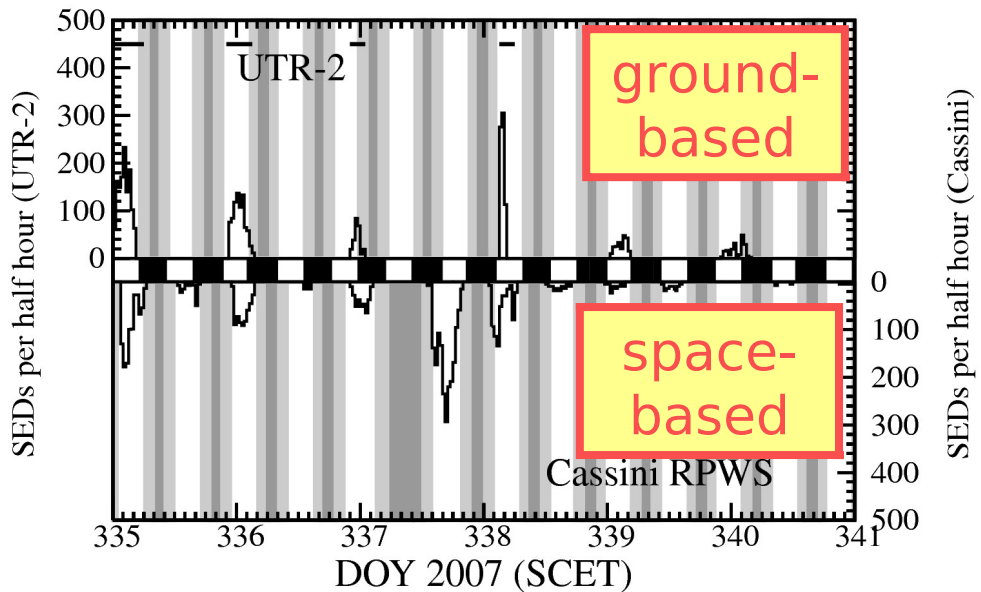
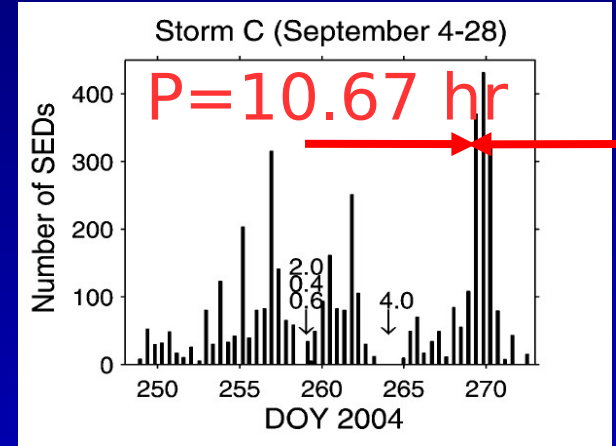
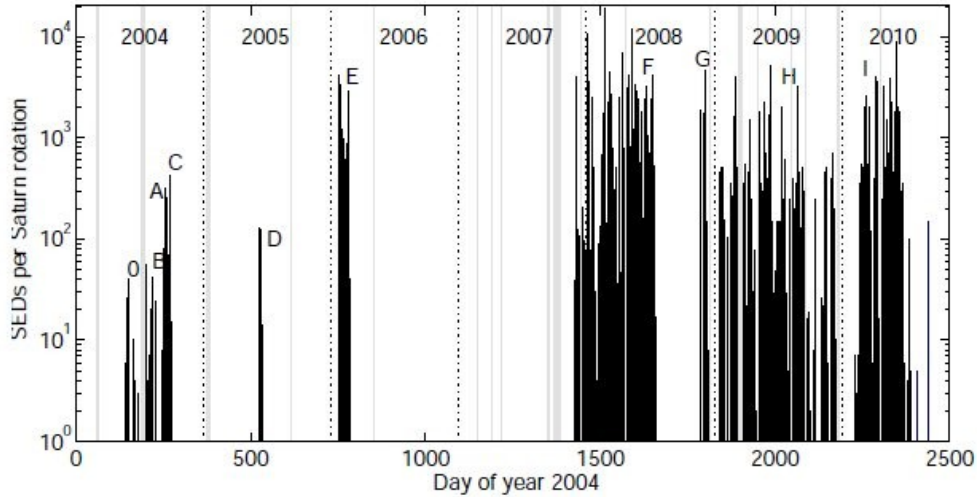
Radio emission from lightning



acceleration of charges \Rightarrow electromagnetic radiation

Lightning on Saturn

[Fischer et al. 2011]



[NASA/JPL-Caltech/Space Science Institute]

Lightning in the solar system

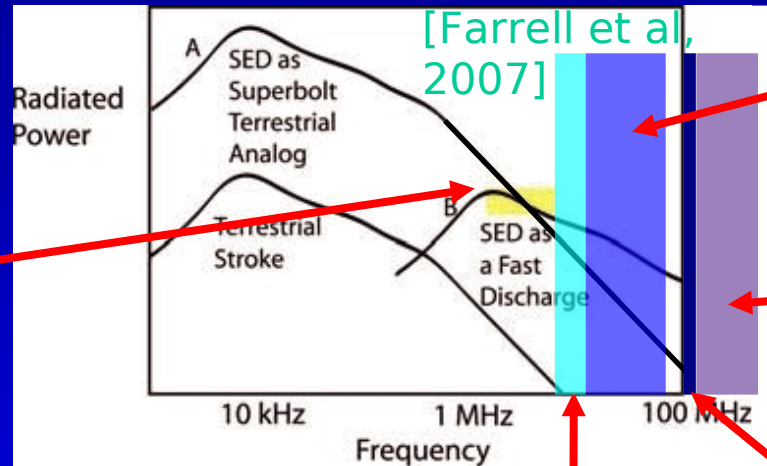
- Saturn: known emission (Voyager, Cassini, UTR-2)
- Uranus: known emission (Voyager)
- Jupiter: possible radion emission (whistlers)
- Mars: possible emission (dust storms)
- Venus: possible emission (whistlers)

Scientific subjects

- Saturn emission timescales (fine structure)
- Saturn lightning spectrum
- Uranus? Neptune? Mars? Venus?



CASSINI



NenuFAR



LOFAR



UTR-2



WSRT

Observing strategy

- tracking observations of solar system planets
- dynamic spectra: 10 ms x 3 kHz x 4 pol.
 - 10 ms x 195 kHz x 3 pol. (after preprocessing)
- 1 ON + 3 OFF beams
- routine obs.: a few obs./month
- TOO: triggered observations (based on optical observations)
 - no trigger so far

Observation status

planet	mode	number of observations	total observing time [h]
Venus	dynamic spectrum	29	89.5
Mars	dynamic spectrum	31	114.2
Jupiter	dynamic spectrum	19	43.6
Saturn	dynamic spectrum	20	46.2
Earth	waveform		
total		99	293.5

Observations from 2020/05 until 2021/10 (+ 2021/11)

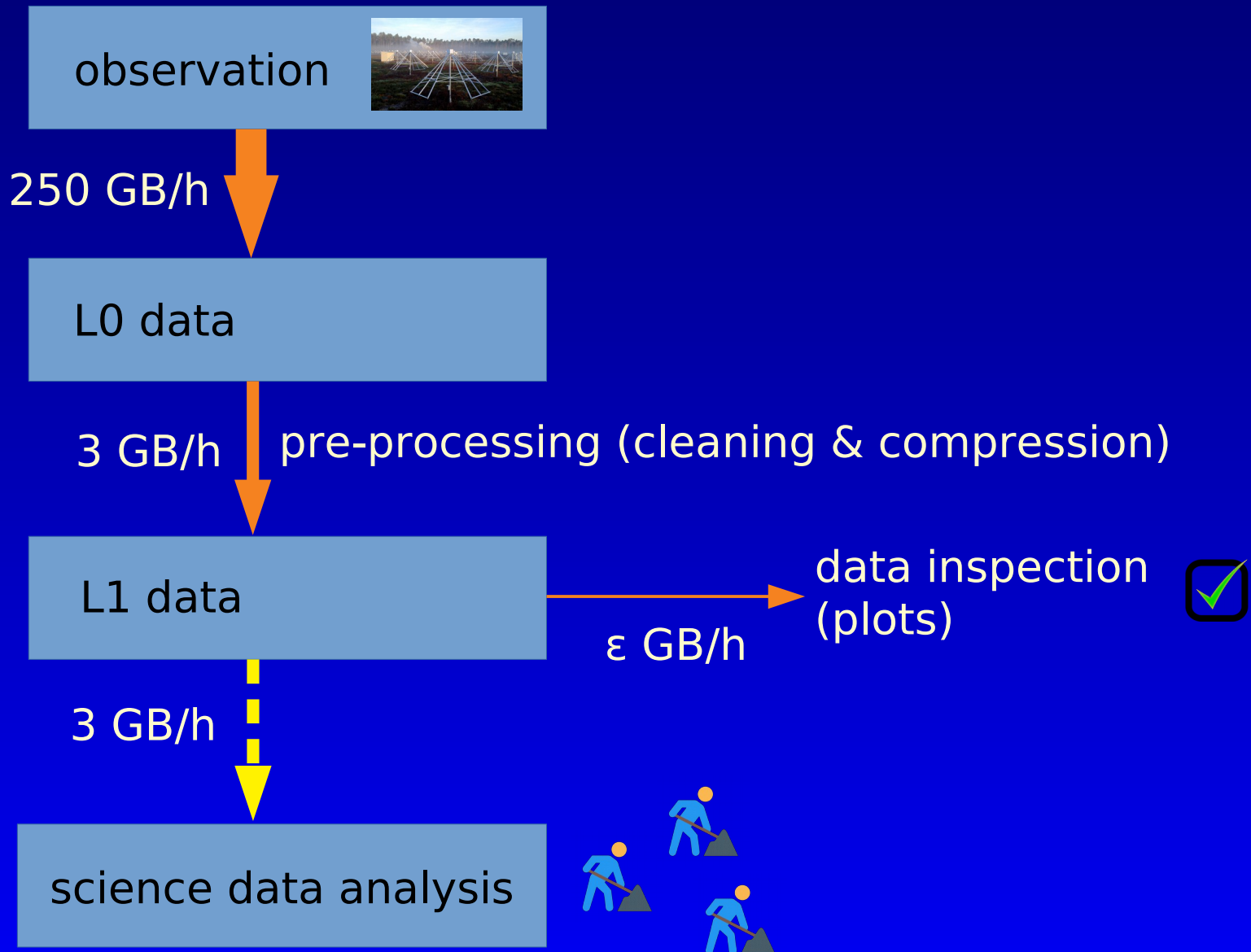
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Earth	waveform		
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Observations from 2020/05 until 2021/10 (+ 2021/11)

No observations planned for 2022 (except TOO's)
→ concentrate on analysis

Analysis status



Next steps

- create scientific pipeline
- reduce current data
- publish a first paper based on the results
- decide which additional data are required