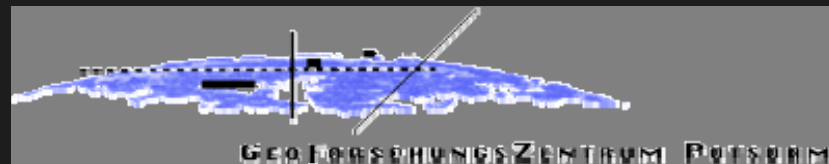
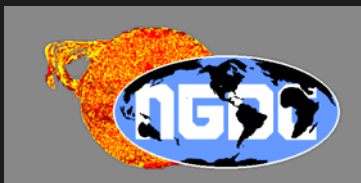


Magnetic field signatures of irregularities observed by CHAMP

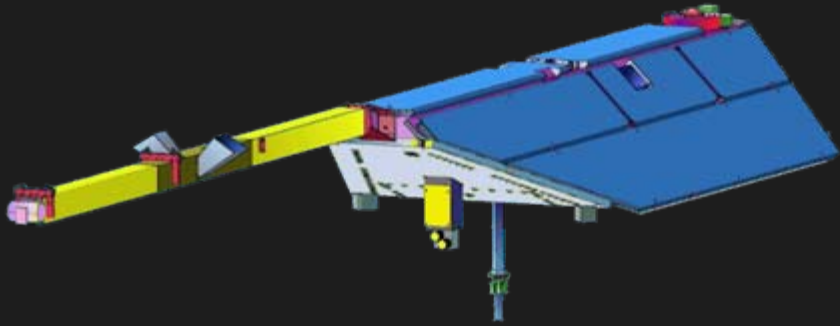
- Dedicated magnetic field satellites
- CHAMP magnetic field profiles
- Maps of F-region irregularities

Stefan Maus (CIRES/NGDC)

Hermann Lühr, George Balasis (GFZ Potsdam)

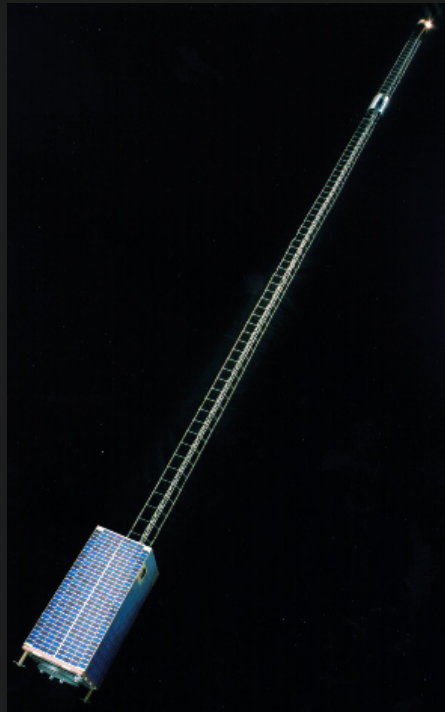


Magnetic Satellites



CHAMP (since 2000)

- 450 km altitude, descending
- Drifts rapidly in local time



Oersted (since 1999)

- 600 – 800 km altitude
- Drifts slowly in local time



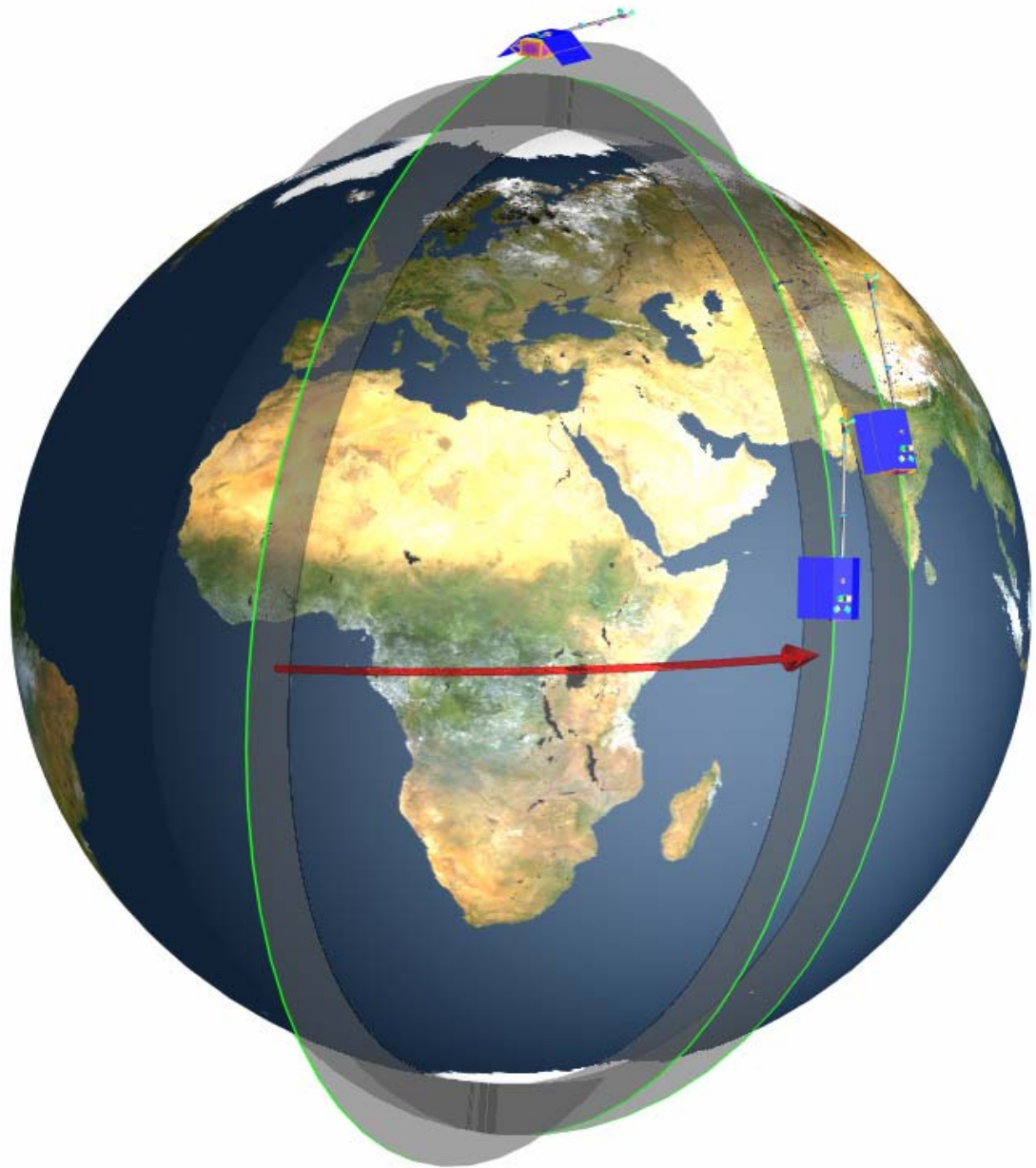
SAC-C (since 2000)

- 700 km altitude
- Sun-sync noon-midnight orbit

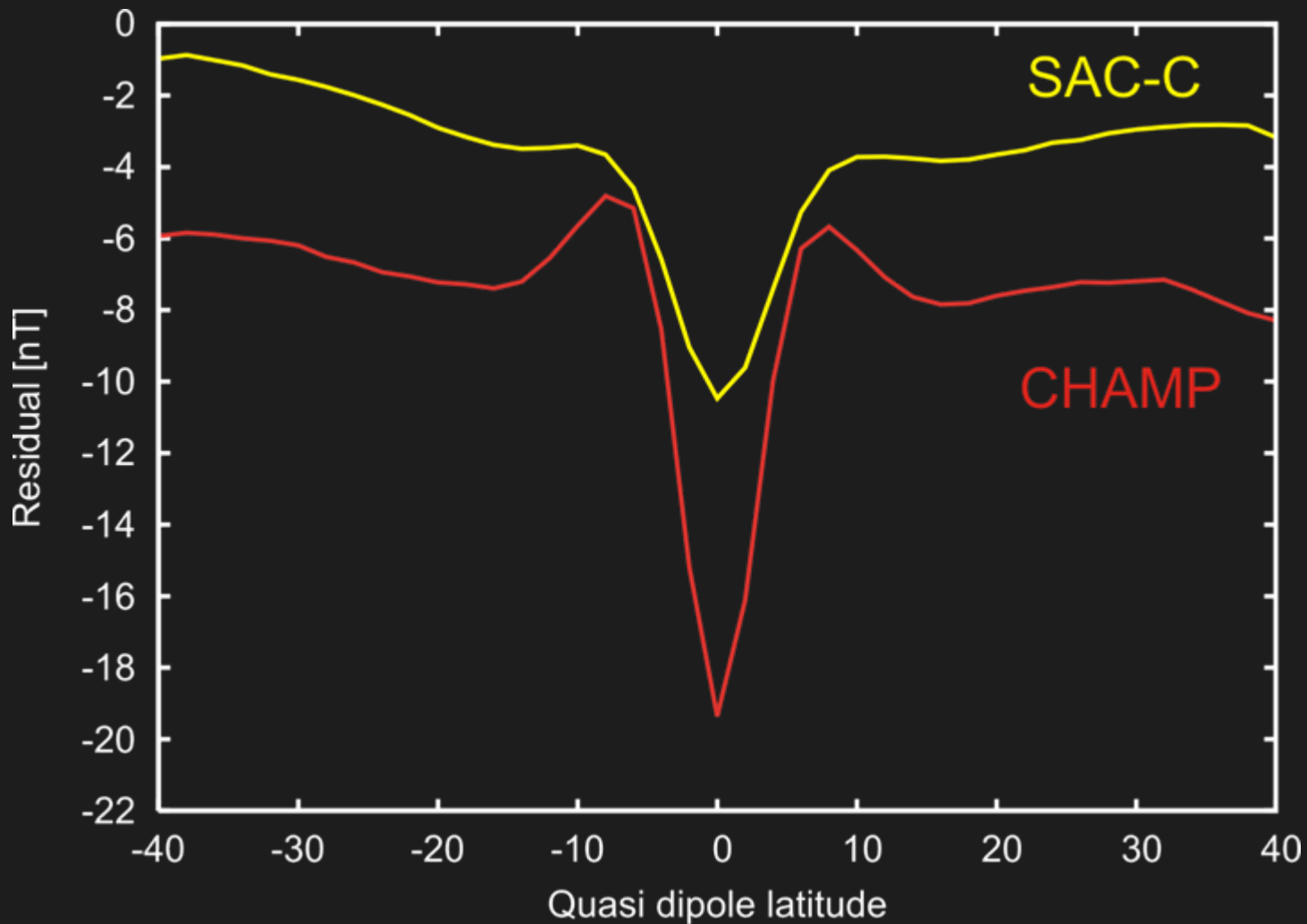
Swarm
Orbit
Constellation

Launch
Scheduled
2009

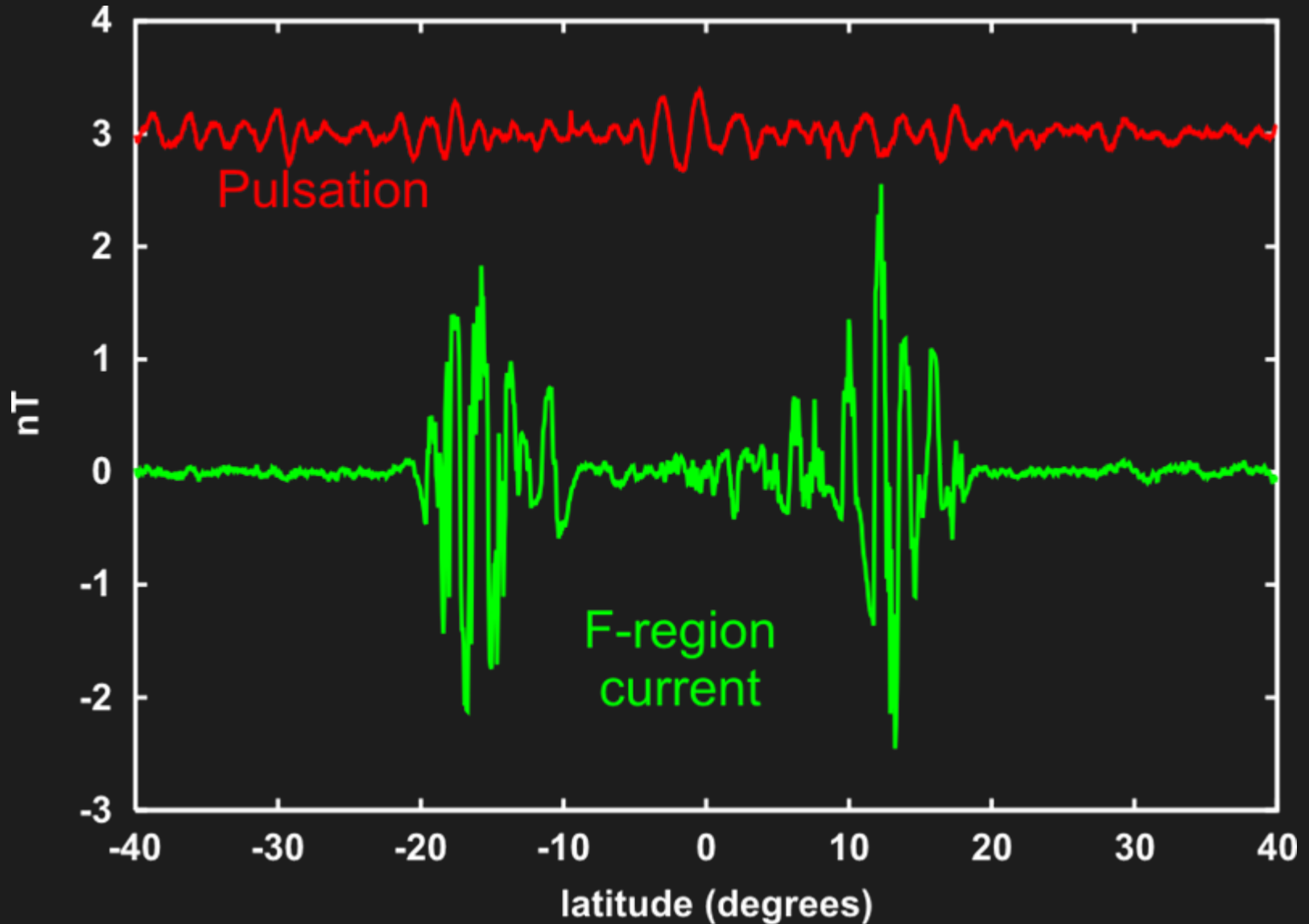
4 year
mission



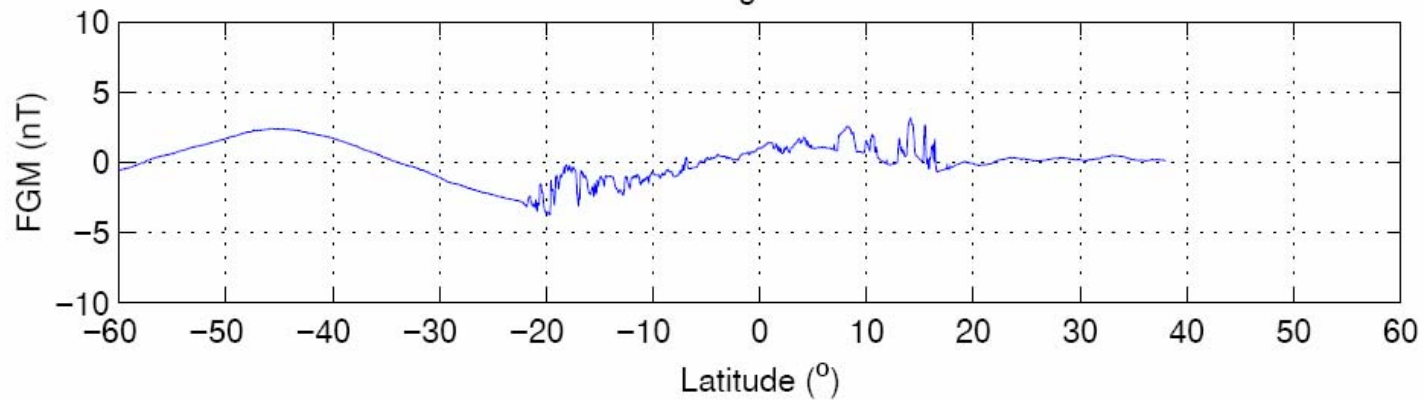
Mean Residual in $|B|$ at 10-11 LT



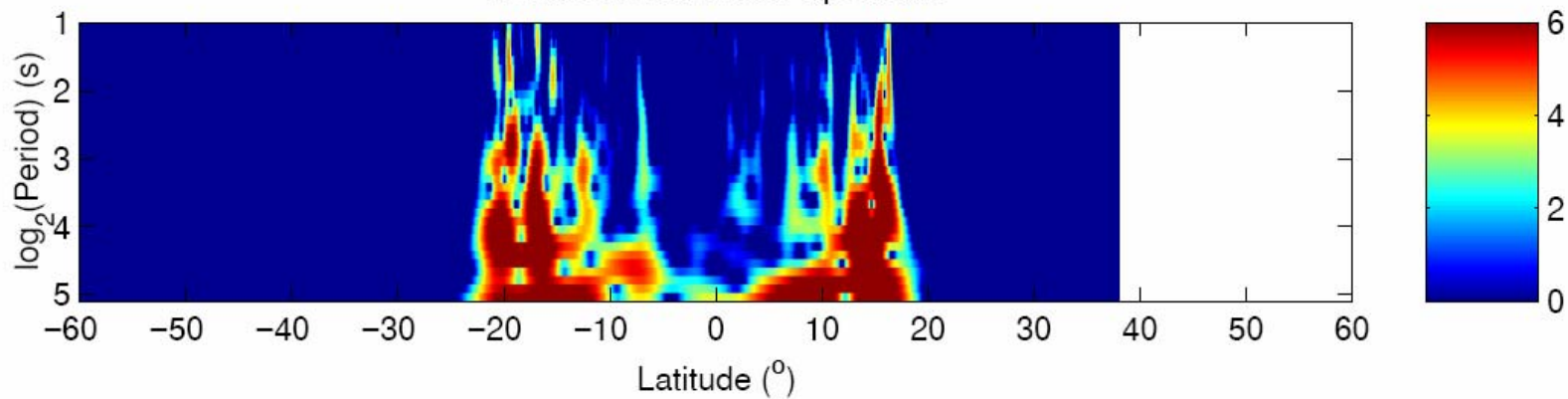
Examples of genuine magnetic disturbances



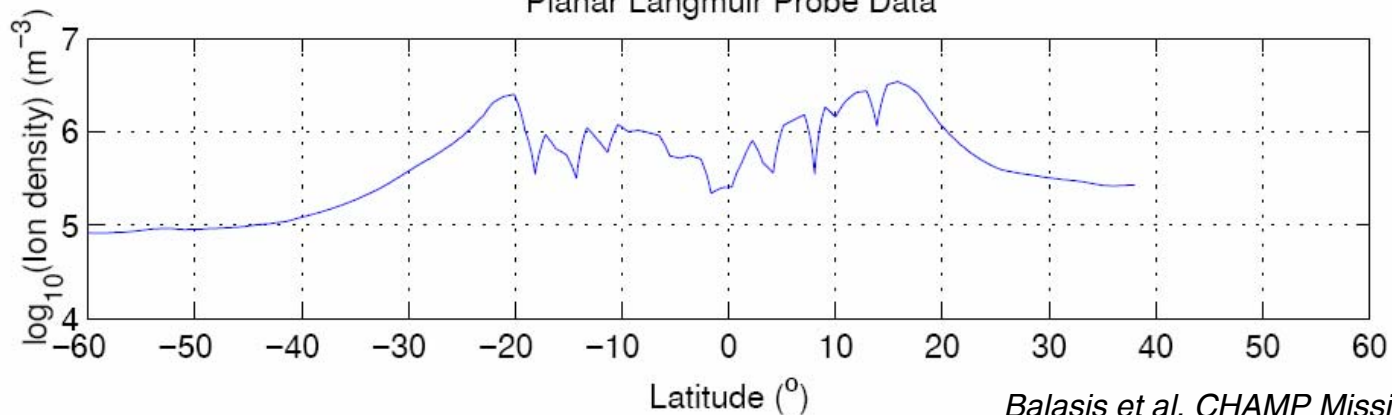
Flux Gate Magnetometer Data



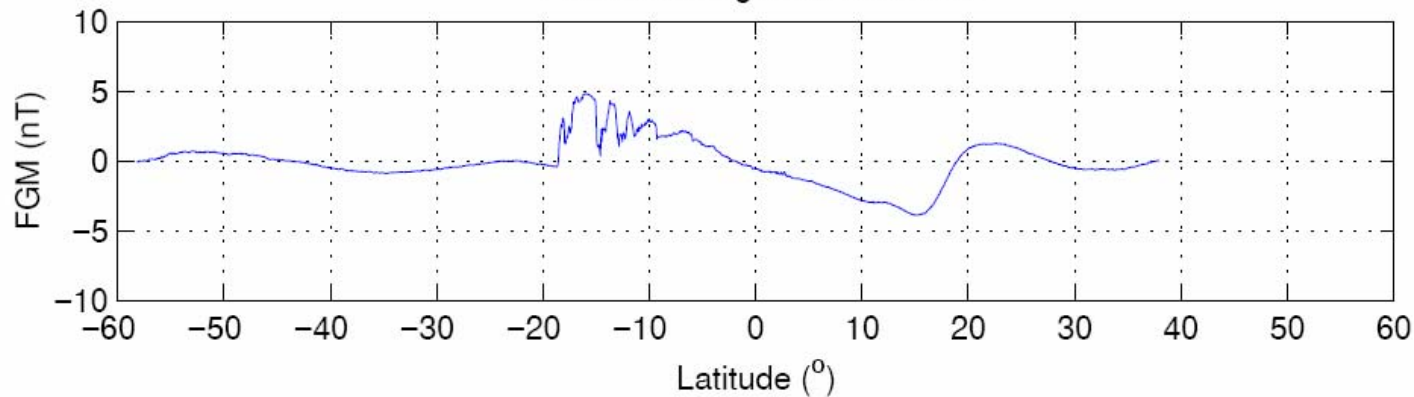
FGM Wavelet Power Spectrum



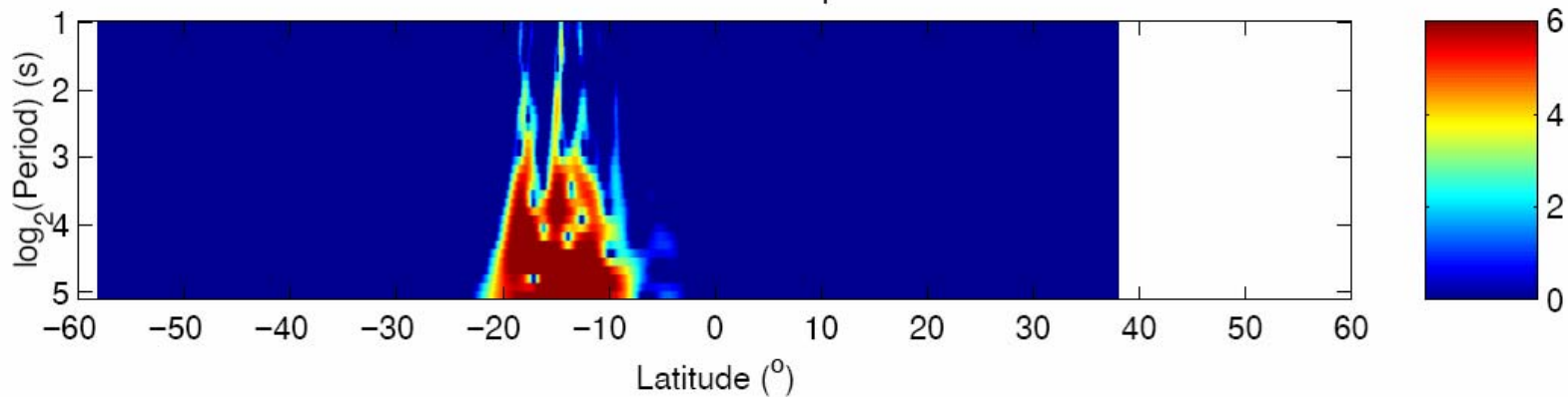
Planar Langmuir Probe Data



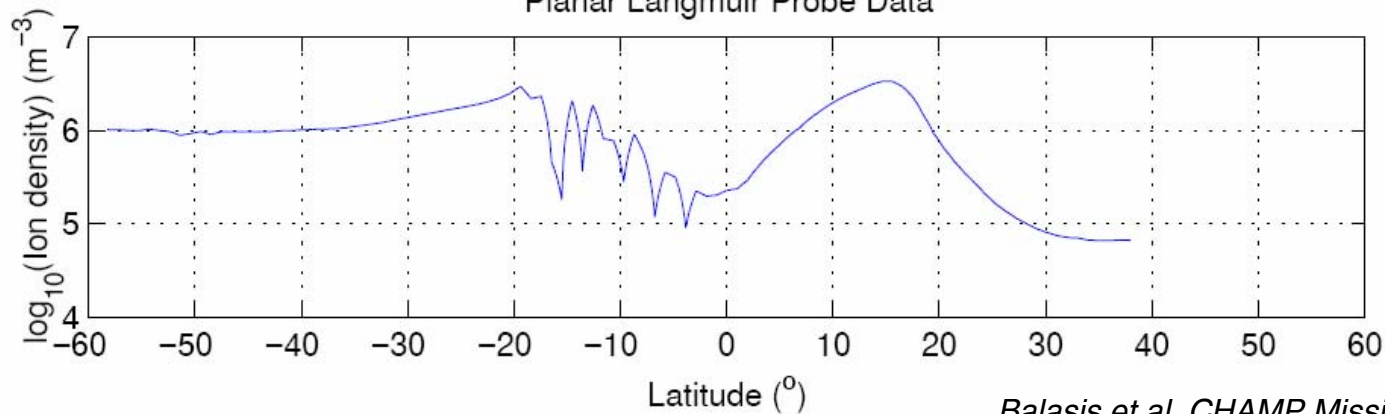
Flux Gate Magnetometer Data



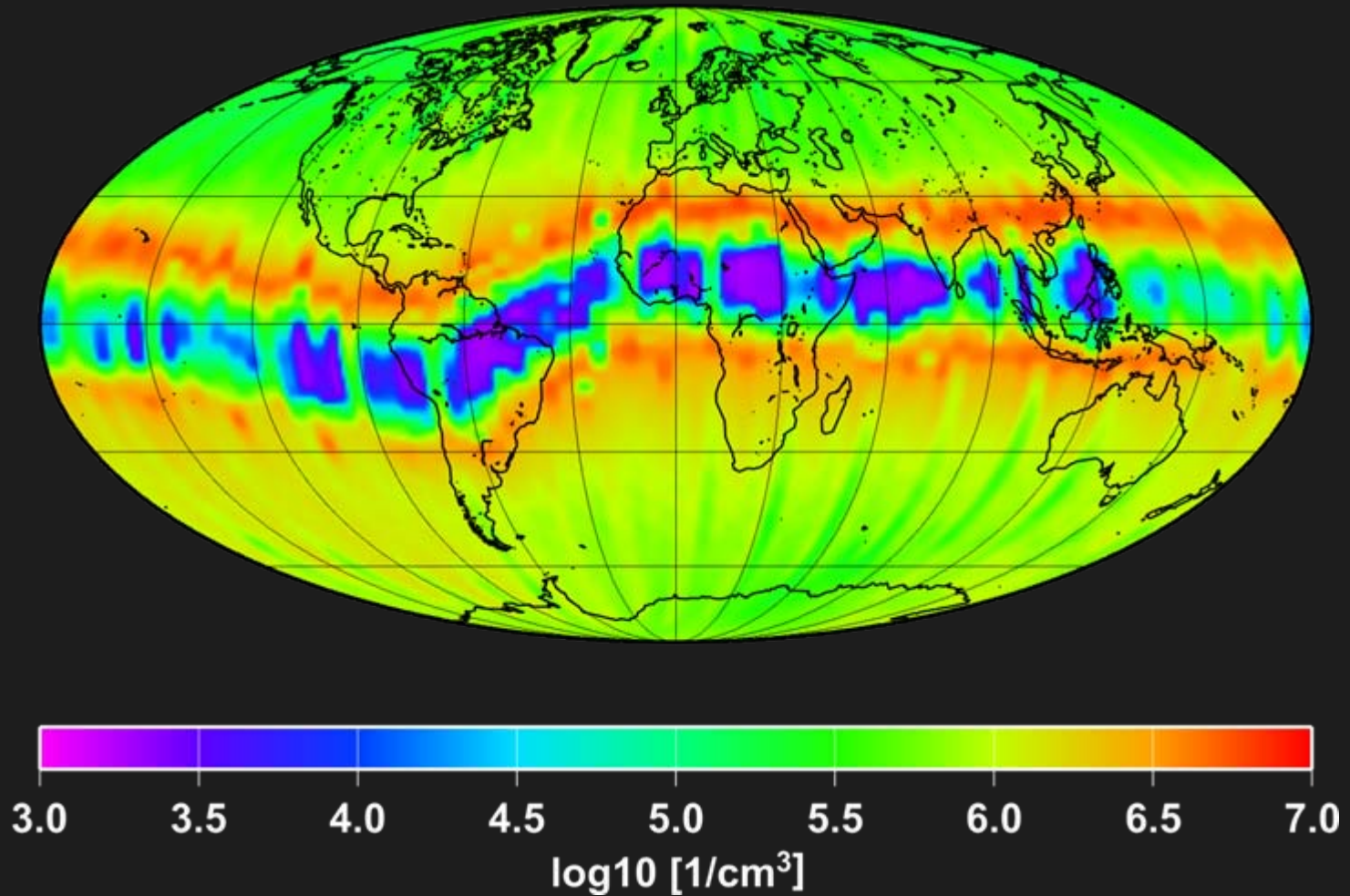
FGM Wavelet Power Spectrum



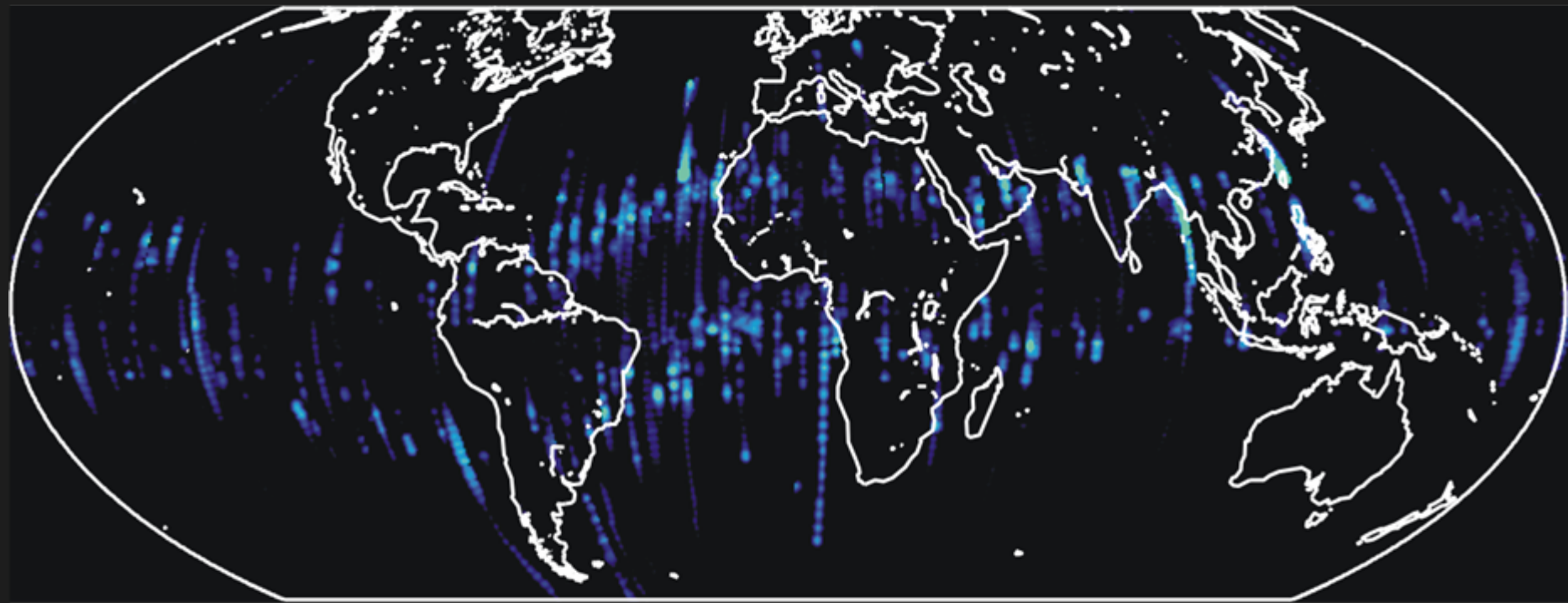
Planar Langmuir Probe Data



CHAMP electron density, 21-23 Oct 2001, 20 LT



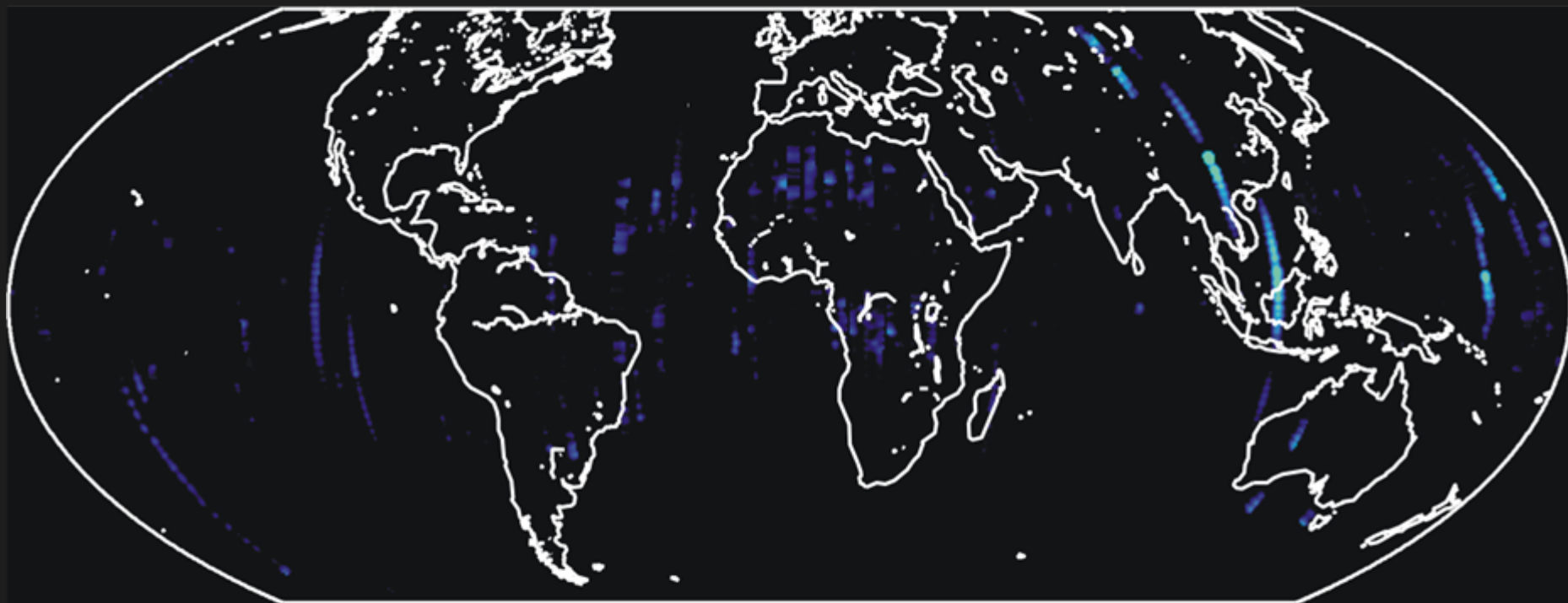
Scalar Residual 19:00-22:00 LT



nT^2



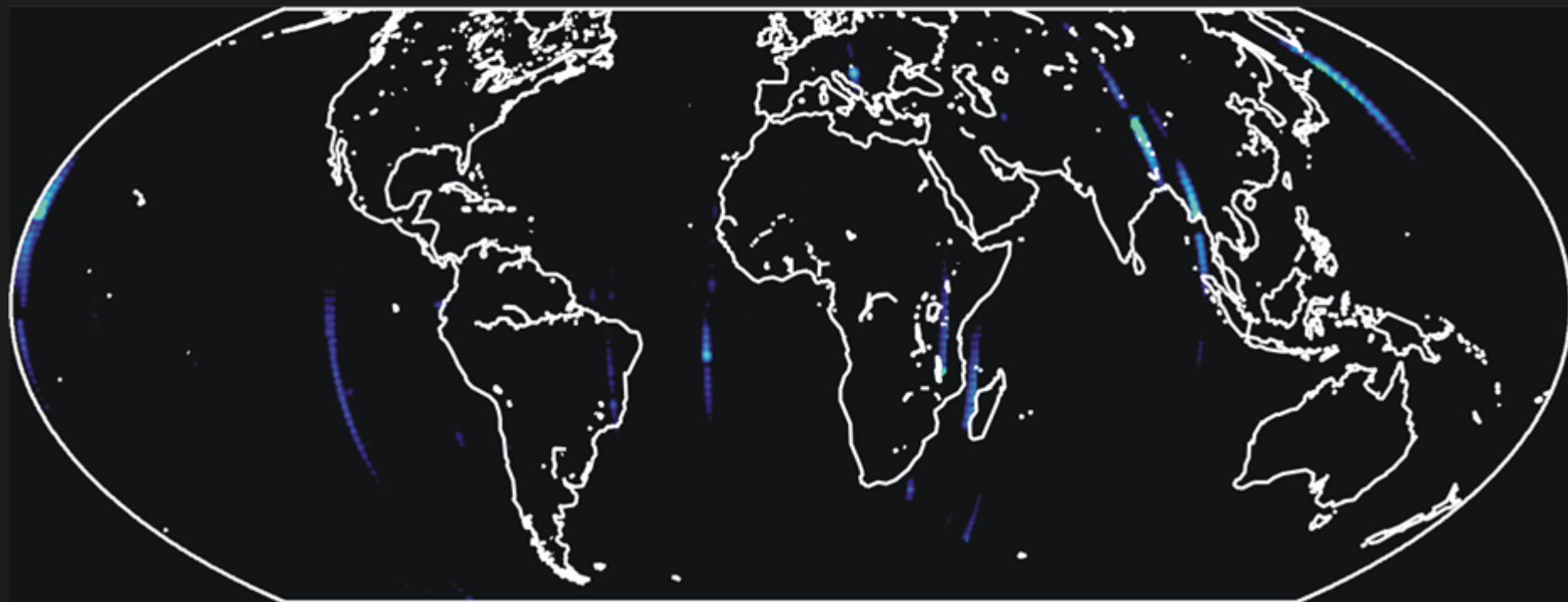
Scalar Residual 22:00-1:00 LT



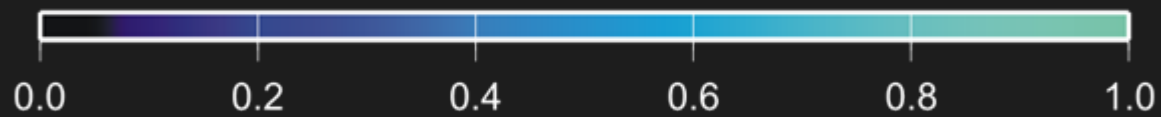
nT^2



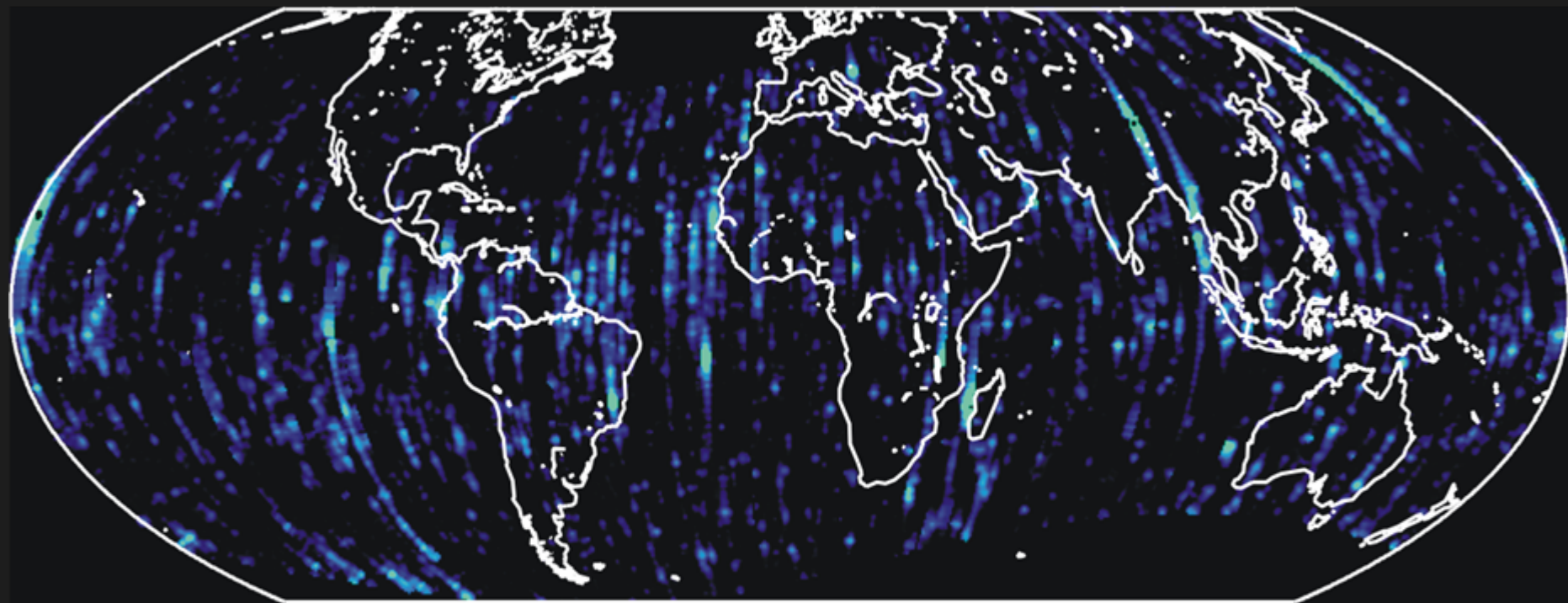
Scalar Residual 1:00-4:00 LT



nT^2



Vector Residual 1:00-4:00 LT

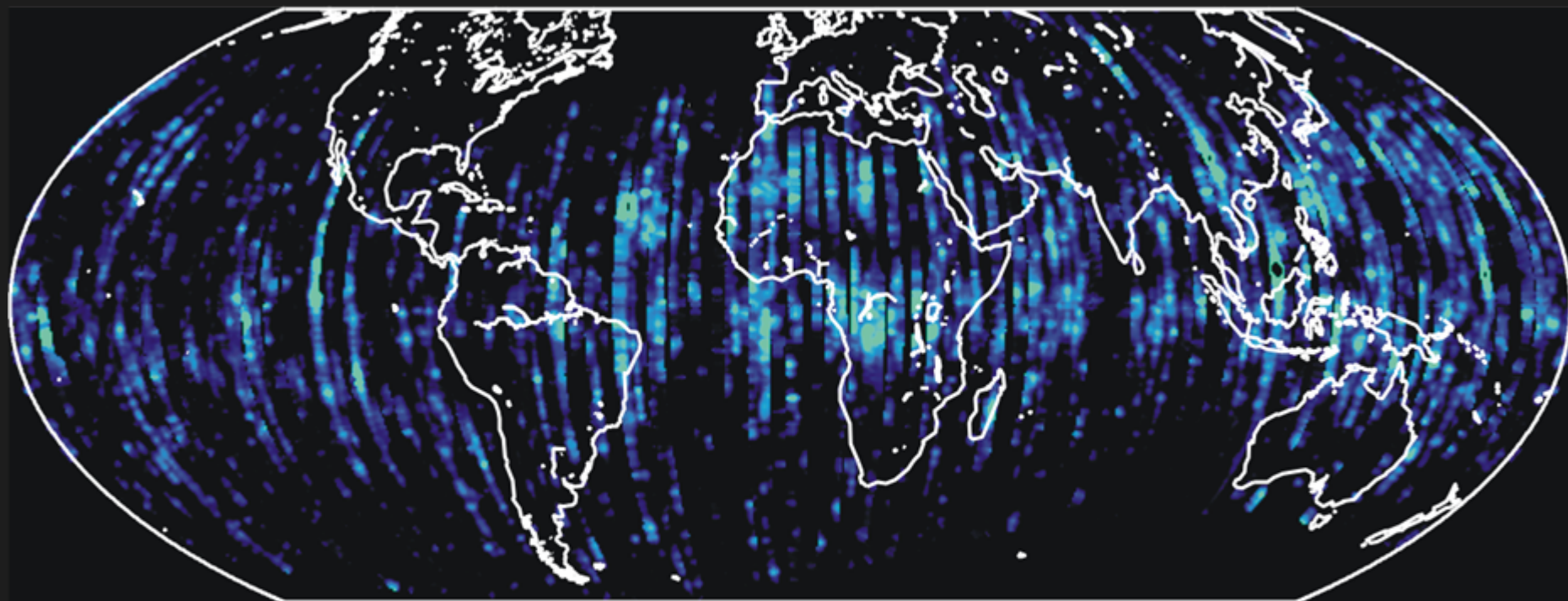


nT^2



S. Maus, C/NOFS Workshop, 2005

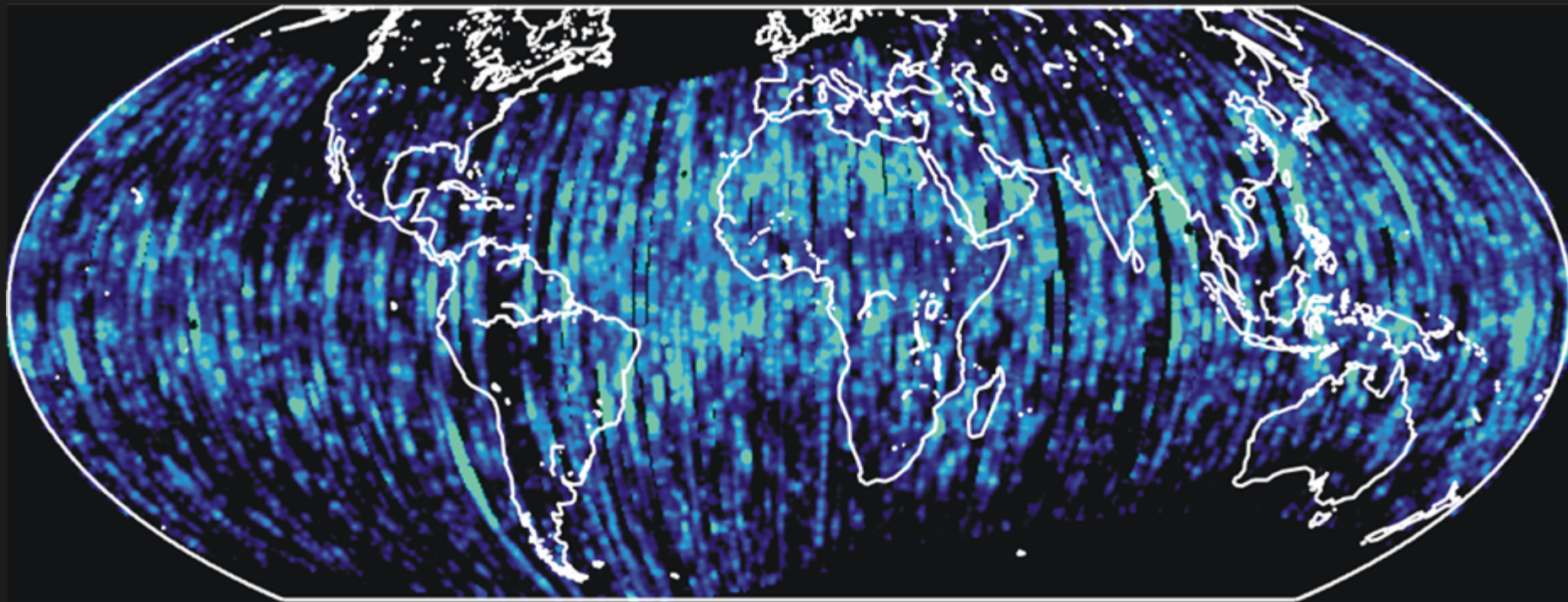
Vector Residual 22:00-1:00 LT



nT^2



Vector Residual 19:00-22:00 LT



nT^2



Summary

Observation

- Plasma irregularities clearly seen in CHAMP magnetic field readings
- Stronger in components \perp to $B \rightarrow$ FACs

Magnetic field opportunities

- C/NOFS flying East/West, CHAMP North/South
- CHAMP now at 370 km altitude, decreasing
- Sampled at 50 Hz = 150m
- Vector components \rightarrow current geometries

