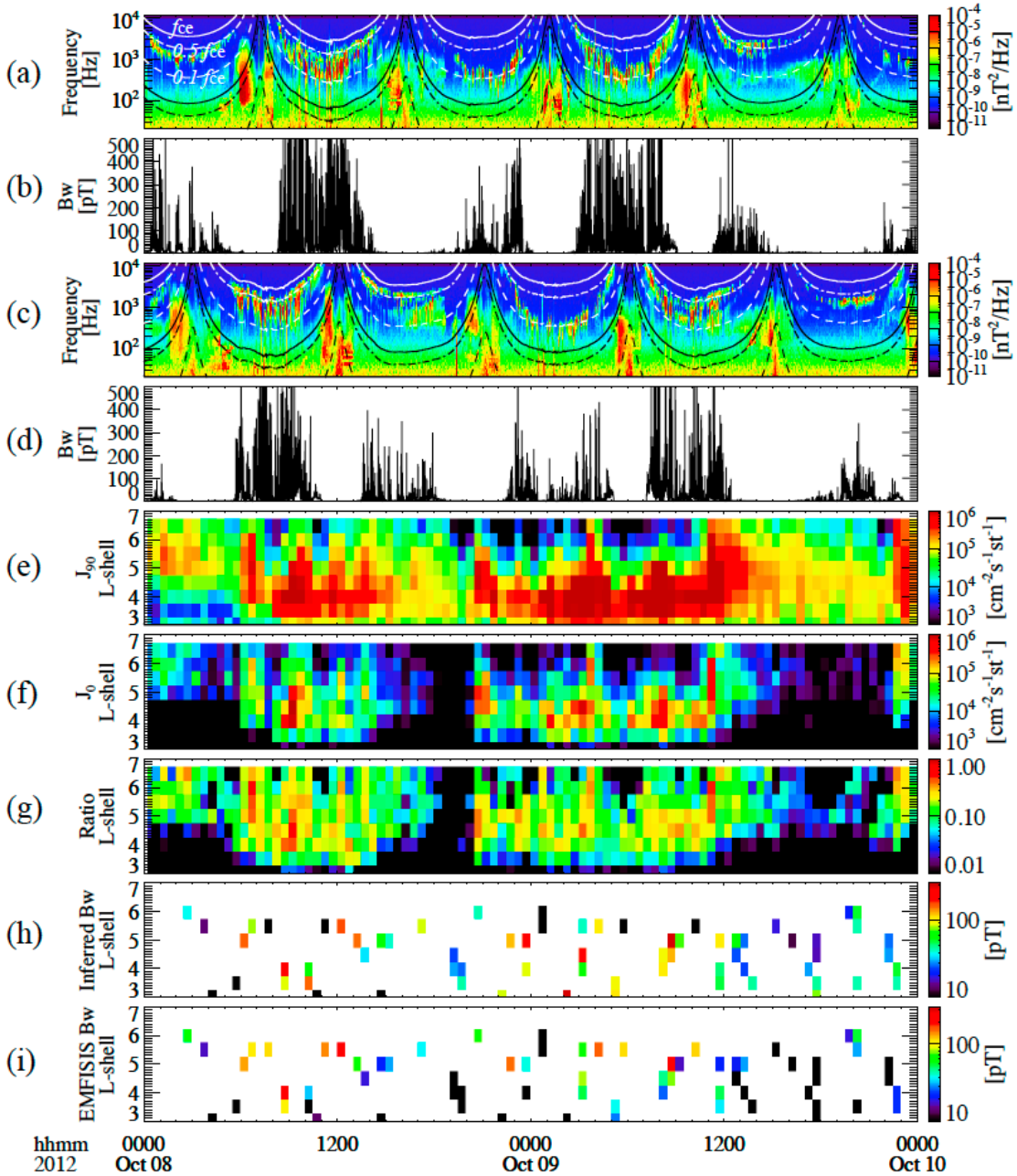
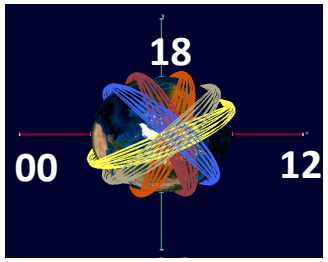
A New Technique to obtain the Global Distribution of Chorus



Wave magnetic field spectral density in the WFR channel and lower-band chorus wave amplitudes integrated over 0.1-0.5 f_{ce} measured on the EMFISIS instrument observed by Van Allen Probes on the dayside.

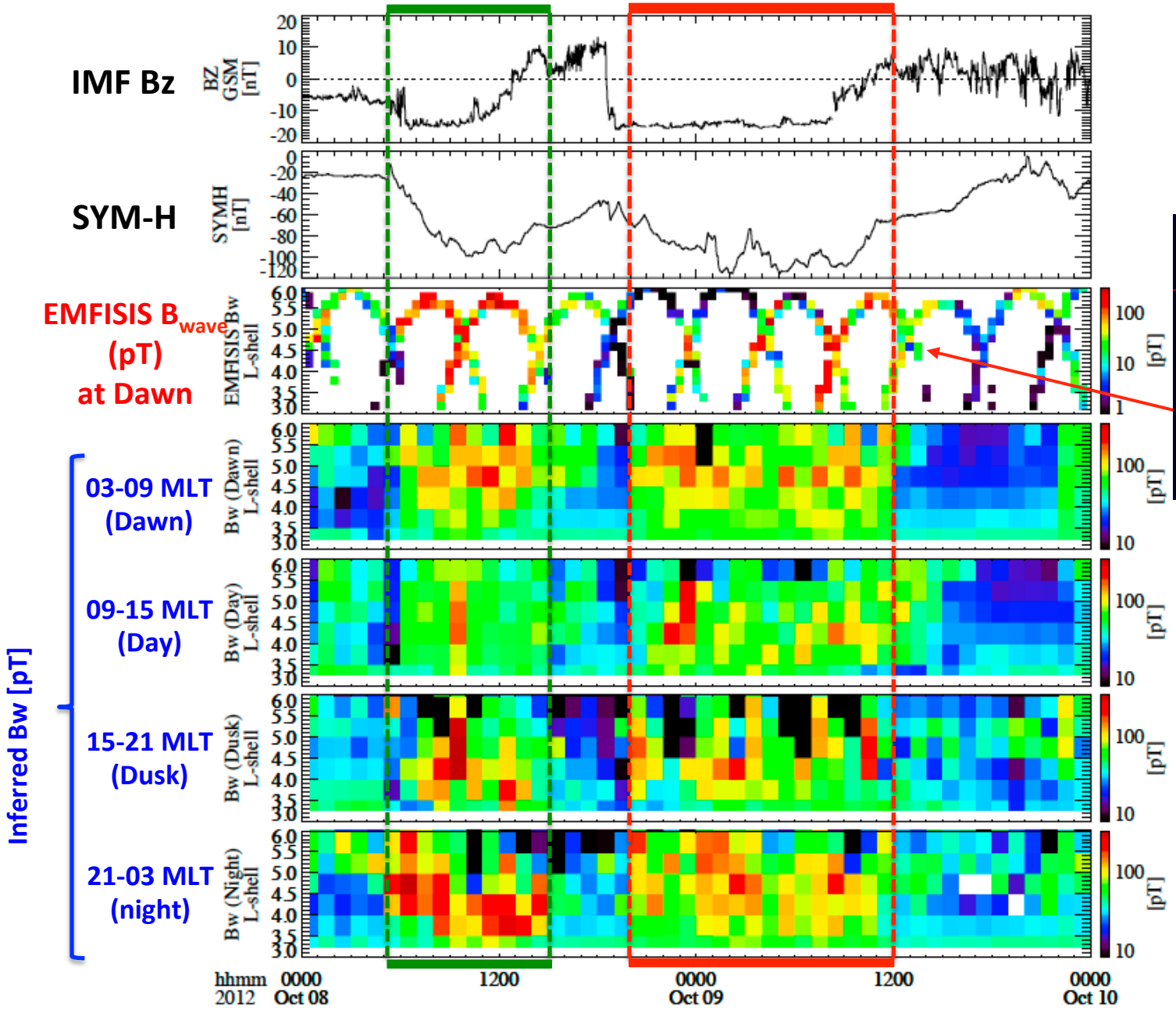
Orbit of POES

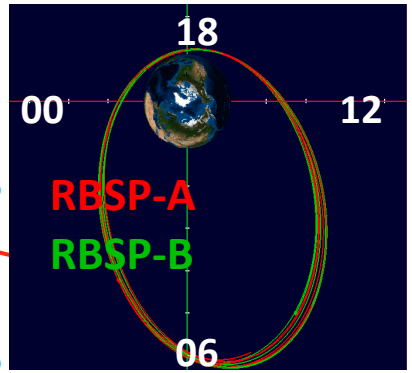


Time evolution of trapped and precipitated electron fluxes (30-100 keV) and their ratio as a function of L-shell observed by POES satellites in the dawn sector. This ratio is directly proportional to the rate of scattering and can be used to obtain a quantitative estimate of Bw.

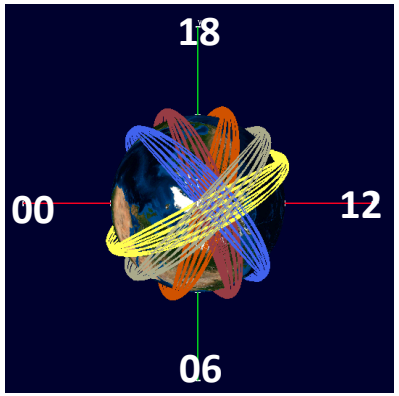
Inferred chorus wave amplitudes and directly measured chorus wave amplitudes during rough conjunction events between POES and Van Allen probes.

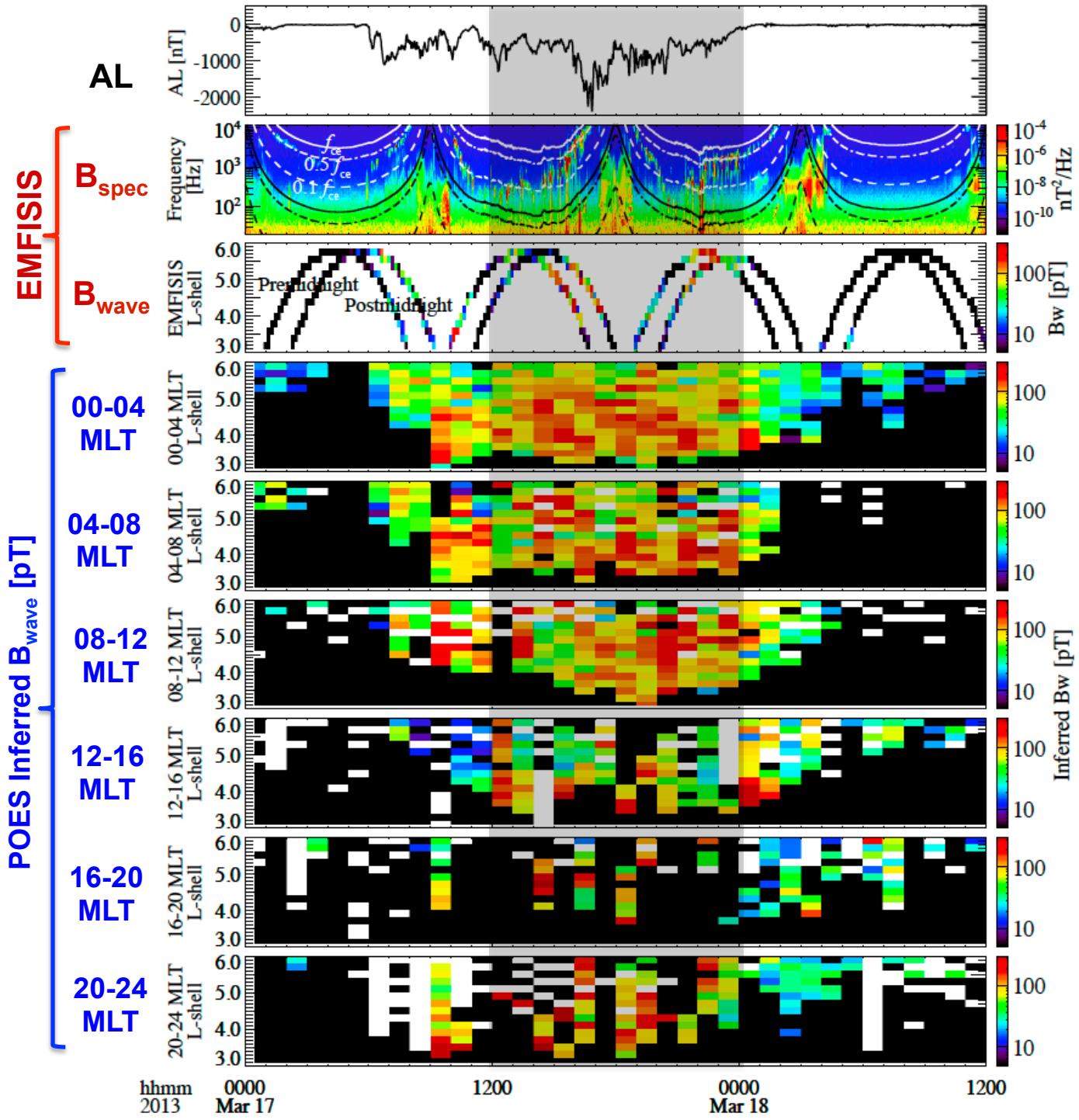
Using POES Fluxes as a Global Proxy for Chorus B_w





Orbit of 6 POES spacecraft





Global distribution of chorus waves

- EMFISIS: directly measure chorus on the nightside
- POES: Infer chorus wave amplitudes using a physics-based technique based on ratio of precipitated and trapped electron fluxes [*Li et al.*, 2013]
- Measured and inferred B_{wave} are generally consistent.

- We have demonstrated that observations of the ratio between precipitation and trapped electron flux in the energy range between ~ 30-300 keV can be used to obtain a dynamic model of chorus wave amplitudes over a broad range of L, MLT with a time resolution of ~ hr.

- During the extended mission there will be several new low altitude CubeSat missions. Can we use new measures available from low altitude CubeSats to extend the technique of remote sensing of the global distribution of chorus wave amplitudes and improve the MLT coverage? If so this will improve our ability our model the role of chorus scattering in diffusion codes.