

Extremely High Frequency (~ 30 Hz) EMIC Wave Observed

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Abstract

We have observed ~ 30 Hz EMIC wave on September 8, 2017 at $\sim 10:45$ to $10:55$ UT. This wave is a 2XH+ EMIC wave. This wave was generated by pitch angle anisotropy of protons with energies in the range of ~ 40 eV - 450 eV. This anisotropy is likely resulted from strong background Magnetosonic wave. The high frequency EMIC wave caused precipitation of low energy particles in the ionosphere.

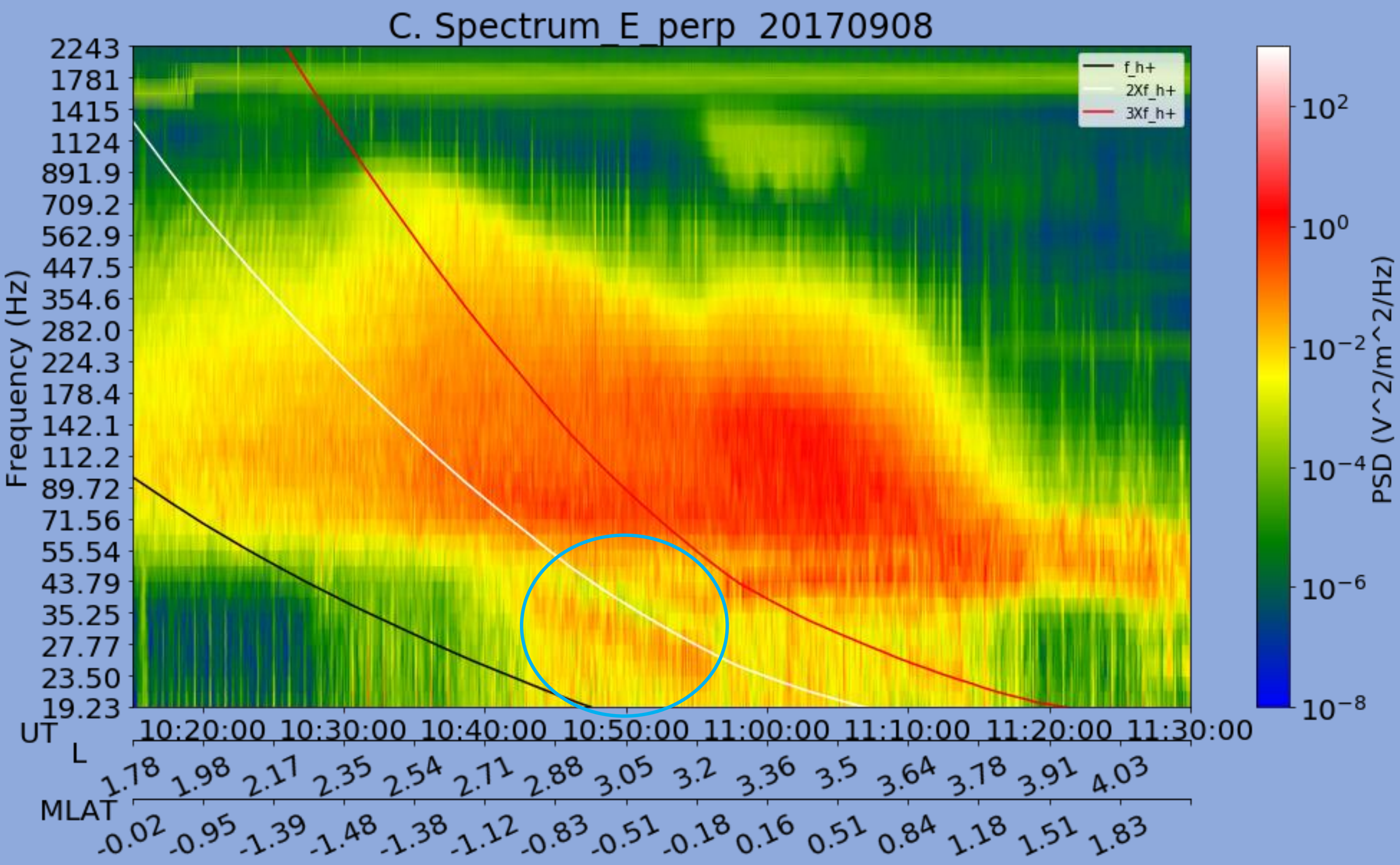
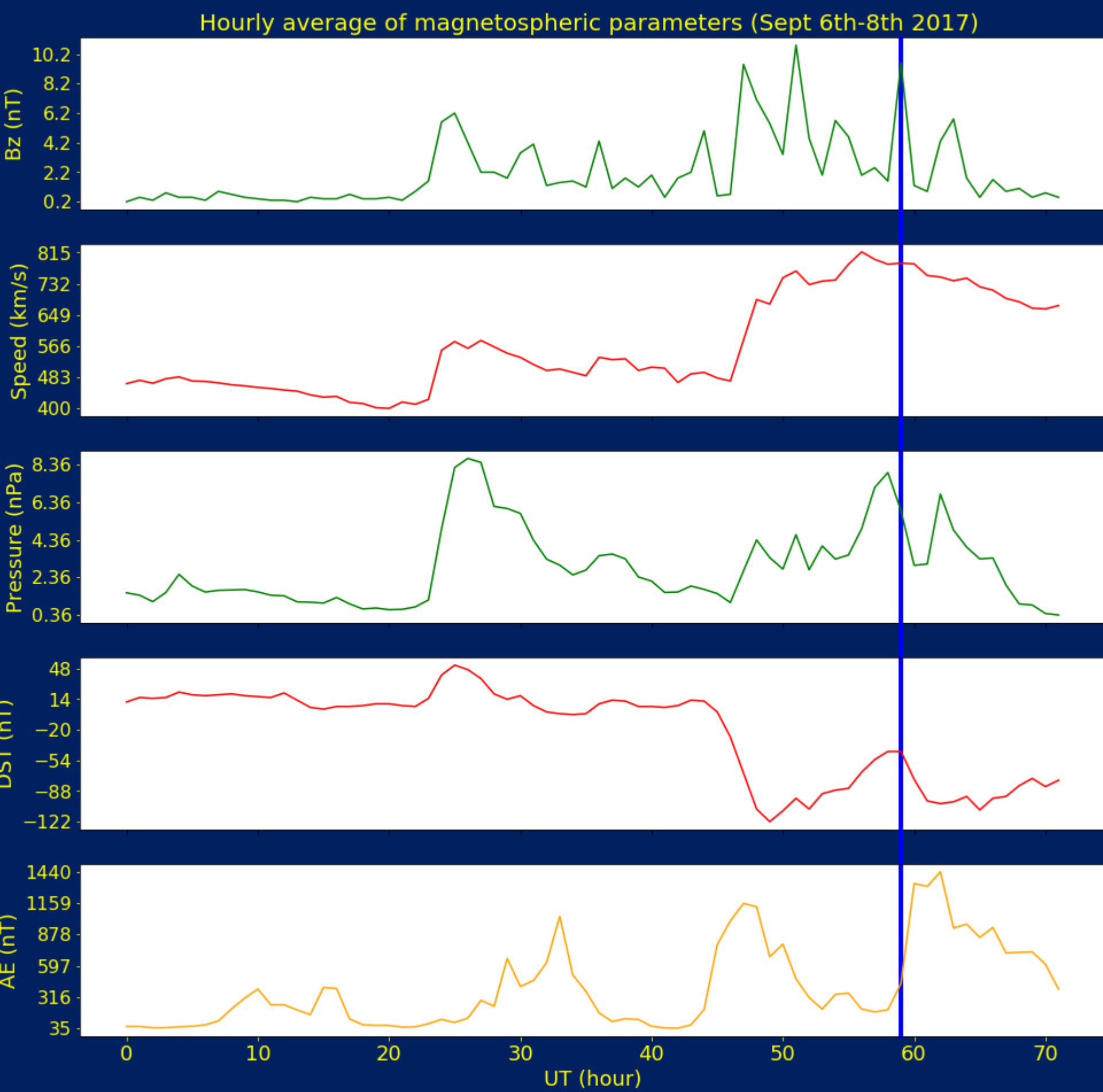
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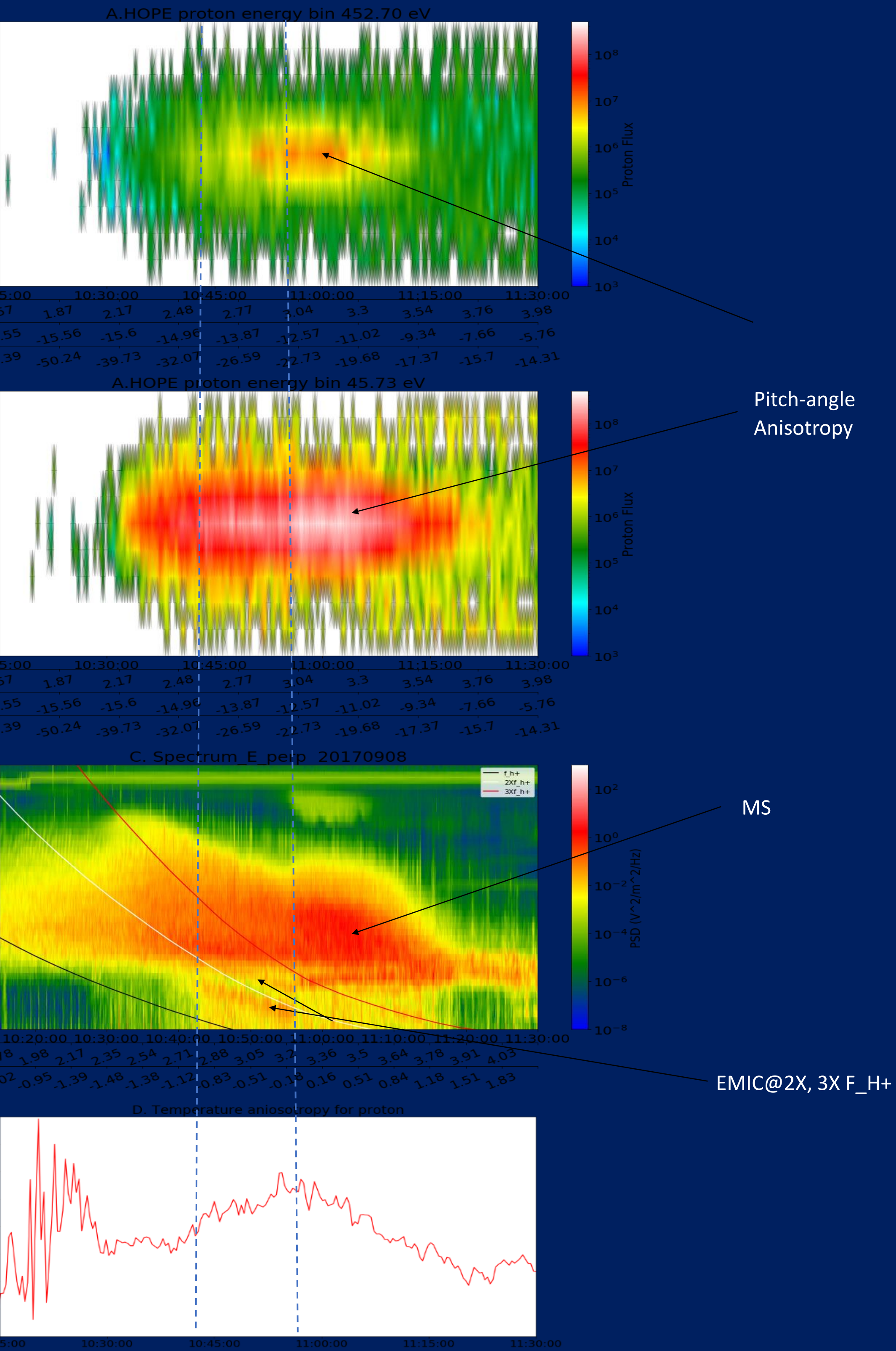
Table 1. Comparing current EMIC observation with typical case

Wave properties	This observation	Typical
Frequency	~ 30 Hz	0.1 – 5 Hz
Wave normal angle (θ_k)	20°- 40°	20°- 30°
Polarization	Left hand ($\epsilon < 0$)	Left hand ($\epsilon < 0$)
Location	~ 0.5° Mag Lat; L ~ 3	±11° Lat; L > 4

Magnetospheric parameters



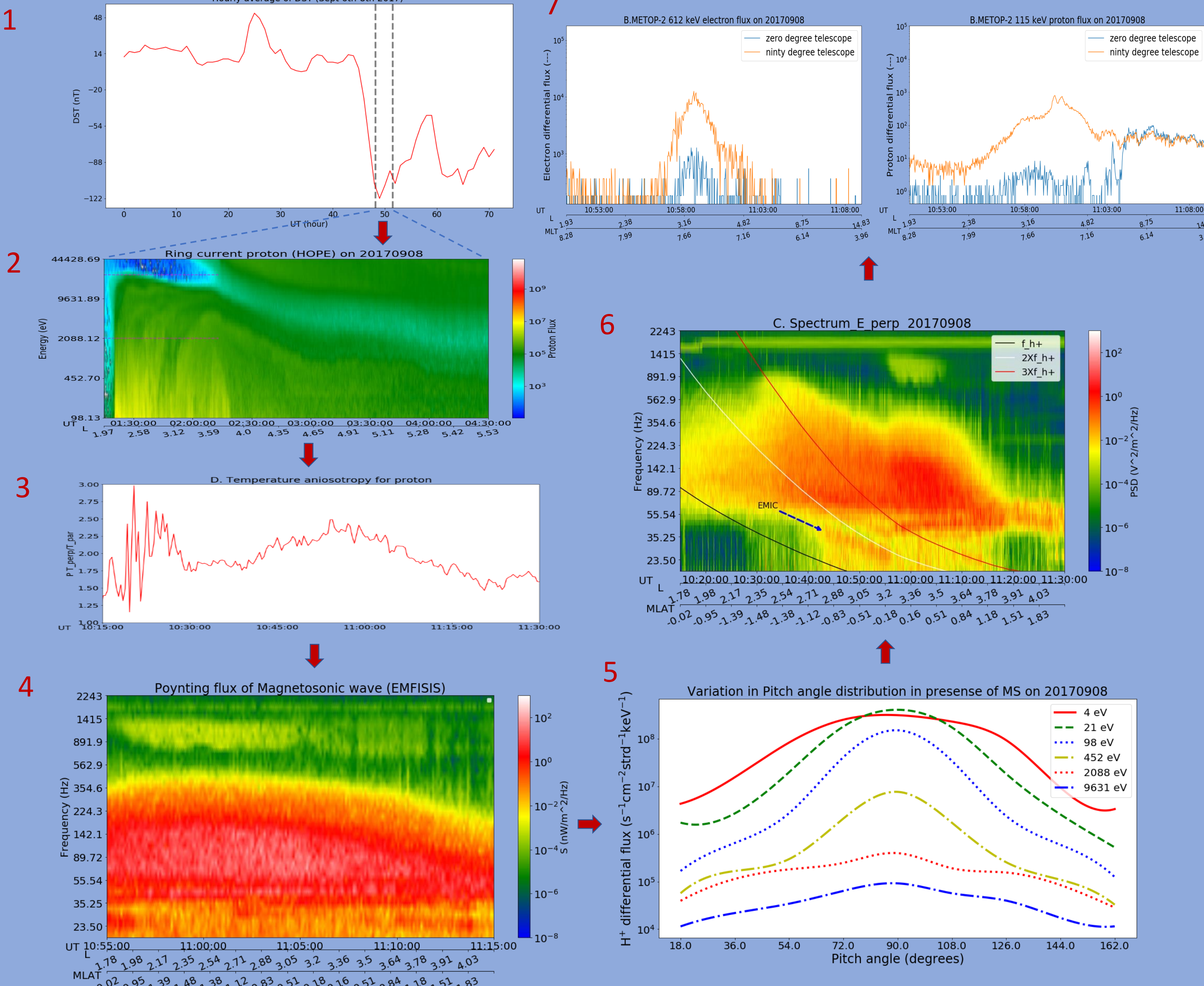
Chain of Wave-particle events observed in the region of Magnetosphere to Ionosphere on September 8th, 2017



Pitch-angle Anisotropy

MS

EMIC@2X, 3X F_{H+}



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