Knocking Round the Radiation Belts: Results from the First Year of DSX Space Weather Experiment Observations

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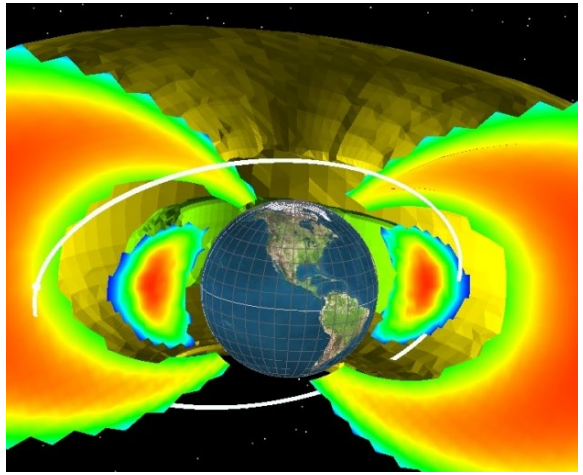
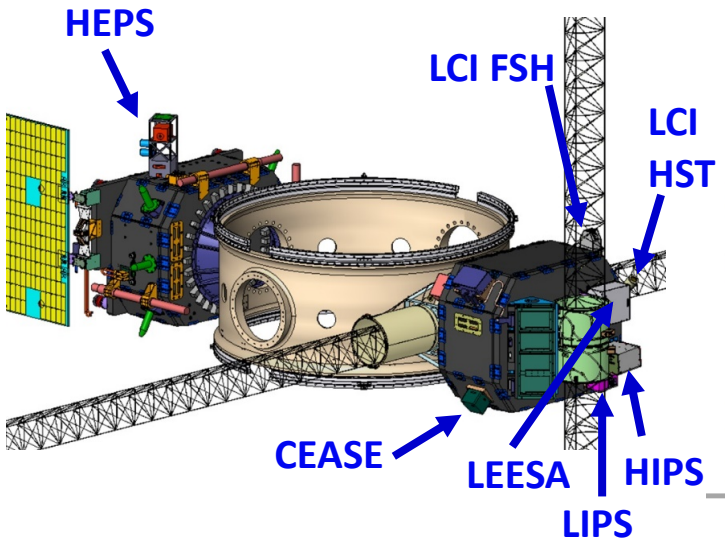
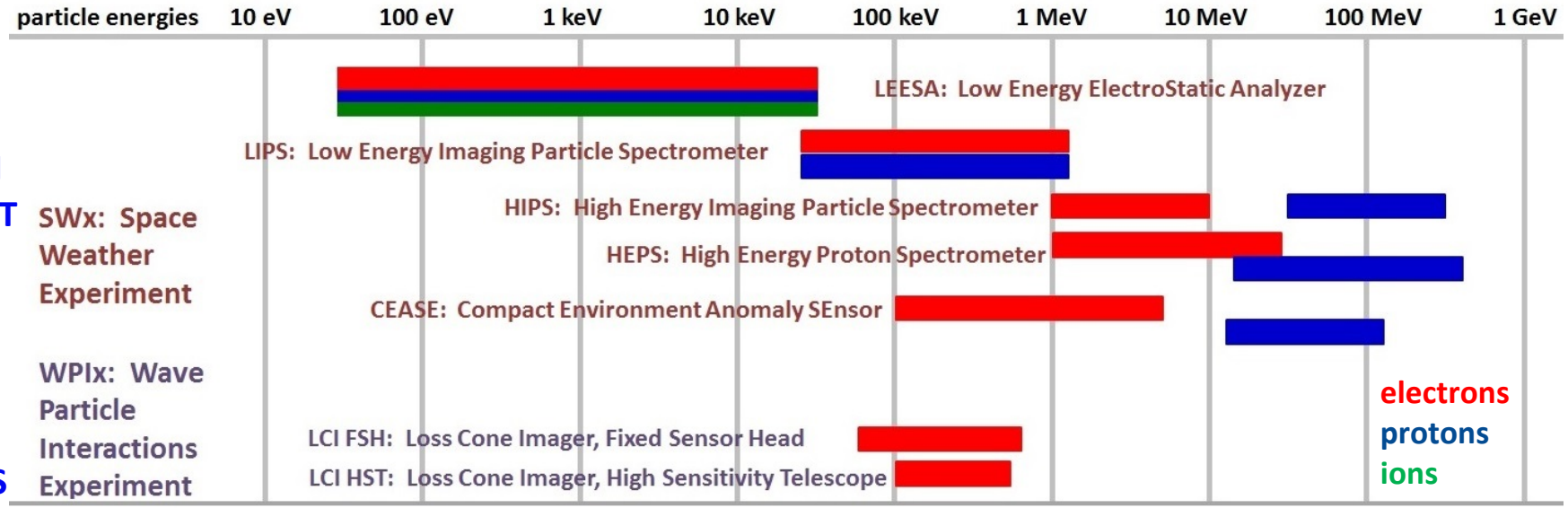


- Launch 25 June 2019
- Currently in extended mission (into 2021)
- 6000 x 12000 km orbit, 42.2° inclination, 5.3 hour period
- Primary experiment: **Wave Particle Interactions (WPIx)**
  - Transmit and measure waves and precipitating particles to understand VLF direct injection performance and diagnose effects
- Secondary Experiment: **Space Weather (SWx)**
  - Measure distributions of protons and electrons to map the MEO environment and diagnose the environment for WPIx experiments
- Secondary Experiment: **Space Effects (SFx)**
  - Advance our understanding of on-orbit degradation and directly measure changes due to MEO radiation environment

DSX SWx and WPIx Particle Instruments



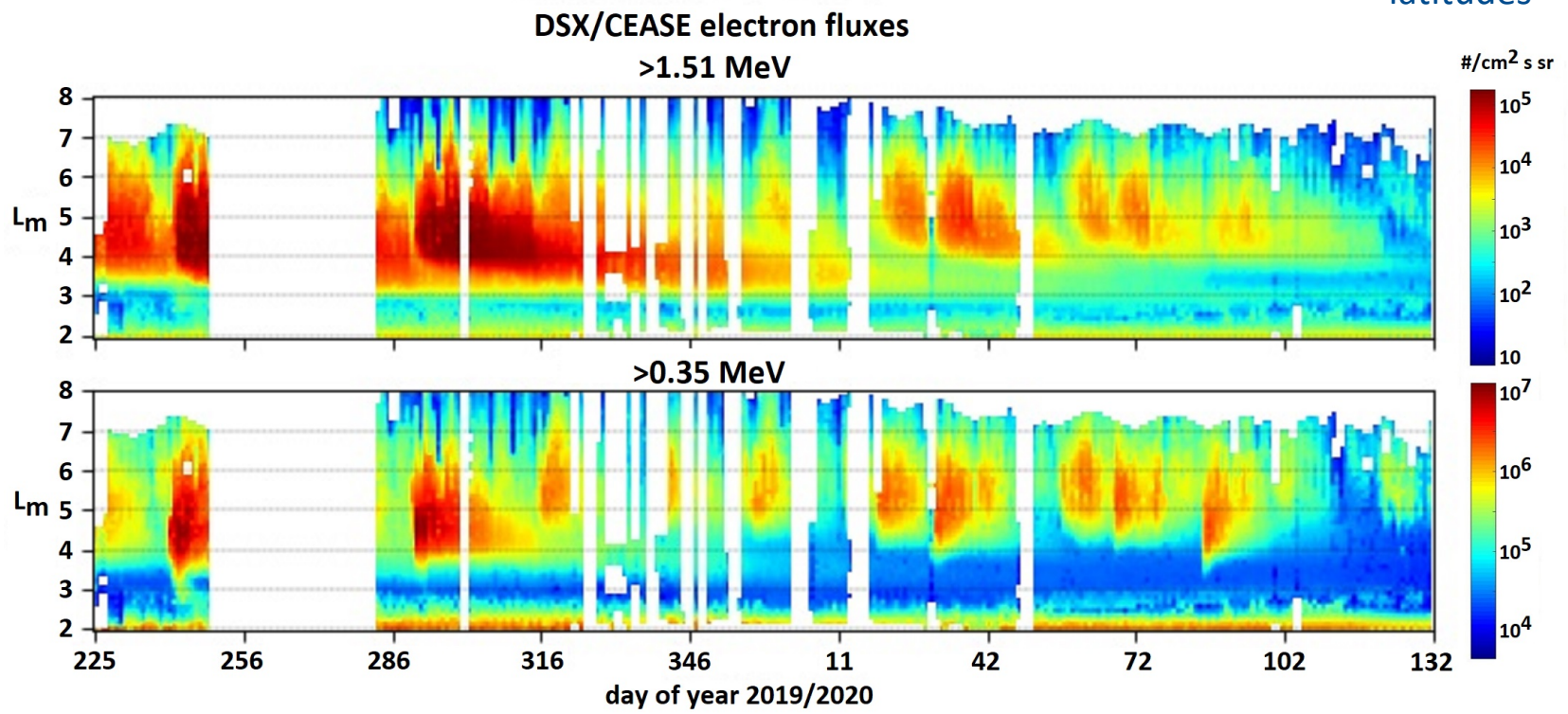


- **LEESA** is an electrostatic analyzer for electrons and ions with 5 angular zones and flexible survey modes among up to 256 energies from 10s of eV to 30 keV
- **LIPS** has 8 imaging scintillator pixels detecting electrons and protons from 60 keV to >2 MeV
- **HIPS** is a particle telescopes with 8 pixels observing 9 proton channels from 14 to 300 MeV and 5+ electron channels from 1.1 to 12 MeV

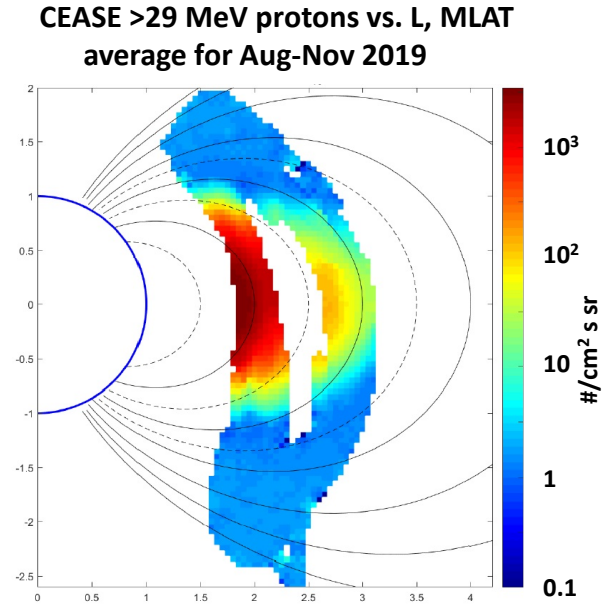
- **CEASE I** includes a particle telescope and two dosimeters, providing 9 electron channels from >0.13 to >3.5 MeV and proton channels from >16 to >79 MeV
- **HEPS** is a particle telescope with 22 proton channels from 20 to 440 MeV, 15-25° field of view
- **LCI FSH** has three pixelated telescopes for 18 look directions observing electrons from 50 to 700 keV
- **LCI HST** is a particle telescope with electron channels from 100 to 500 keV

DSX Early Results and Status

- Inclined DSX orbit provides observations at range of magnetic latitudes



- CEASE monitoring shows dynamics of outer electron belt following end of Van Allen Probes mission



- Calibration still underway for LIPS, HEPS, LEESA
- Spectral inversion of CEASE data is in progress
- LEESA data show effects of high power transmissions on local plasma, results under analysis
- **Also see results from DSX wave observations including active experiments—**
  SM016 on 9 Dec