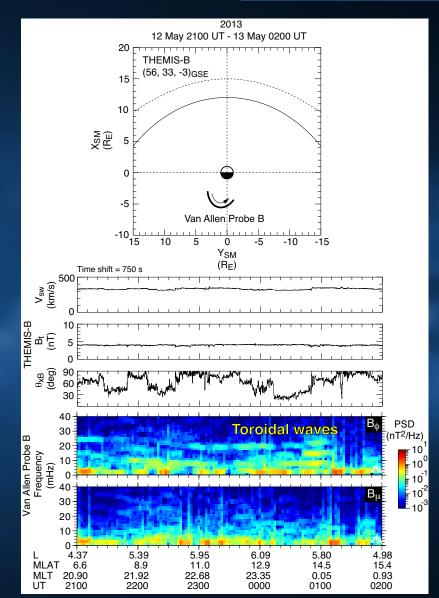


New source of midnight Ultra Low Frequency (ULF) waves



Not all ULF waves in the nightside magnetosphere are excited by disturbances coming from the magnetotail.

- ULF waves (periods ~ 30 s) generated in the ion foreshock are a well-known driver of toroidal standing Alfvén waves observed in the dayside magnetosphere.
- The toroidal waves become strong when the interplanetary magnetic field is parallel to the Sun-Earth line and the foreshock surrounds the dayside magnetosphere.
- Van Allen Probes observations reveal that the foreshock waves propagate even to the midnight sector of the magnetosphere and excite multiharmonic toroidal standing Alfvén waves there.
- Detection of the nightside waves is possible when there is no disturbance in the near-Earth magnetotail.