

Analysis of whistler, hiss and other magnetospheric plasma waves observed simultaneously during a series of conjunctions between ARASE (ERG) and Van Allen Probes

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The recently launched JAXA satellite ARASE (formerly known as ERG) probes the Earth's inner magnetosphere, particularly the Van Allen radiation belts. This new addition to the constellation of inner magnetospheric satellites complements the other missions therein, including Van Allen Probes, and provides the opportunity to investigate magnetospheric processes on a variety of scales. We have identified several magnetic and geographic conjunctions between ARASE and one or both of the Van Allen Probes satellites. With the Van Allen Probes EFW instrument we are collecting continuous burst mode waveform data during and around these conjunctions, and the ARASE and Van Allen Probes EMFISIS instruments are collecting burst mode data as well. The first several collections have been received on the ground, and initial studies reveal both correlated and uncorrelated whistler and hiss waves on the two satellites. Several additional conjunction events are planned in the coming weeks. We plan to analyze the waves observed on the two satellites during the conjunctions, including performing correlation and polarization analysis to investigate the spatial scale of the various magnetospheric wave modes and how the different waves propagate and affect magnetospheric particle populations. This data will be complemented by data from other satellites in the inner magnetosphere as well as ground data including magnetometers and the World Wide Lightning Location Network. This study will add significantly to our understanding of magnetospheric processes and scales.

Keywords: ARASE and Van Allen Probe conjunction, Whistler, Hiss and other magnetospheric plasma waves, Scale sizes, propagation effects, wave-particle interaction