Determining the global coherence of plasmaspheric hiss waves in the magnetosphere

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Plasmaspheric hiss waves is important in the radiation belt. Previous papers have shown that considering the variability of wave parameters will improve the effectiveness of modeling wave-particle interactions in the Radiation Belt, but less is known about how rapidly (and by how much) wave characteristics vary. We use measurements from the Van Allen Probe mission to study the correlation and ratio of wave amplitudes over a range of frequencies covering the plasmaspheric hiss band as a function of separation and time delay between two satellites. A total of 1851 events with small separation (<1R₆) were found. The statistical results show that, as separation between spacecraft increase, the characteristics of hiss change in both correlation of the wavepacket and amplitude. Moreover, we find that the coherence between spacecraft is strong at low-L, and decreases strongly with increasing L. We investigate the coherence of plasmaspheric hiss on geomagnetic indices and solar wind driving. We discuss the ramifications of our results with relevance to understanding the global characteristics of plasmaspheric hiss waves.