



Whistler-mode waves with large amplitudes in the radiation belt region: new results from the Van Allen Probes

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More than two years of systematic in situ measurements have been collected by the Van Allen Probes Electric and Magnetic Field Instrument Suite and Integrated Science's Waves instrument. We use high-resolution multicomponent waveforms collected by this instrument to analyze properties of large-amplitude whistler-mode waves at frequencies of several kHz. These waves can have instantaneous amplitudes at a level of a few hundred picotesla but they can also reach over 1 nT.

We investigate crucial parameters for wave-particle interactions: Poynting vector and wave vector directions. We conclusively show that the observed waves grow to very large amplitudes in a very narrow region around the magnetic equator. Peak values of the instantaneous amplitude then decrease with the distance from the magnetic equator, with no signs of further convective growth. Instantaneous wave vector angle is very variable but its median value is low, around 20 degrees with respect to the magnetic field line, not showing any increase with latitude.