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Observations of Whistler-Mode Chorus with Van Allen Probes
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The Van Allen Probes mission provides an excellent opportunity to observe whistler-mode chorus and its role in the radiation belts. The plasma wave instrument on the two probes, called Waves, includes six identical waveform receivers covering the frequency range from 10 Hz to 12 kHz. The instrument measures three orthogonal magnetic field components and three orthogonal electric field components of waves. This complement supports wave-normal and Poynting flux analyses of chorus as well as other wave modes that interact with radiation belt particles. Extensive use of burst modes provides multicomponent waveforms enabling the study of individual chorus elements, including their substructure. The early-mission publications confirm the importance of chorus to the local acceleration of electrons in the outer radiation belts. The orbital precession of the twin Van Allen Probes through a complete range of local times now allows for a new survey of the distribution of chorus emissions. Hence, we now have the tools to study chorus from the nonlinear growth in chorus element substructures through synoptic studies of the near-equatorial occurrence of chorus out to a distance of approximately 5.8 Earth radii.

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