Properties of the Dayside Outer Zone (DOZ) Chorus Relevant to Wave-Particle Interactions

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Fine structure and polarization of chorus in the Dayside Outer Zone (DOZ) portion of the Earth's magnetosphere are studied using GEOTAIL plasma wave and magnetic field data. Dayside chorus is noted to be composed of ~ 0.1 to 0.5 s rising tone emissions called elements. Chorus rising-tone elements are composed of coherent subelements or packets with durations of ~ 0.5 to 1.0 x 10^{-2} s. The peak amplitudes within a packet can be ~0.2 nT or greater. The subelement or packet amplitudes are at least an order of magnitude larger than previously-estimated chorus amplitudes obtained by power spectral measurements. Chorus waves are detected propagating both almost along the ambient magnetic field, B_o, and at oblique angles near the Gendrin angle. It is experimentally found that chorus is circularly polarized (to first order) independent of the direction of propagation relative to Bo. We demonstrate that this feature can be theoretically explained. There will be important consequences for wave-particle interactions which we will explore in our talk.