

Spectral Interpretation of Radio Sounder-Stimulated Magnetospheric Plasma Resonances in Terms of Kappa Distributions

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Magnetosphere sounders stimulate plasma resonances between the harmonics of the electron cyclotron frequency and above the upper-hybrid frequency. More than three decades ago they were recognized as equivalent to ionospheric topside-sounder-stimulated resonances, designated as Qn resonances a decade earlier, with one important difference: the magnetospheric Qn frequencies often indicated that the background electron-velocity distribution was non-Maxwellian. Interpretations based on bi-Maxwellian and kappa distributions have been proposed. Here we expand on the latter, which requires fewer free parameters, by comparing kappa-derived Qn frequencies with observations from the Radio Plasma Imager on the Imager for Magnetopause-to-Aurora Global Exploration (IMAGE) satellite.