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A Tale of Two Planets: Comparing radio emission processes on Earth and Saturn

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Abstract

Recent in situ wave and particle observations in the acceleration regions of Earth and Saturn by the Cluster and Cassini spacecraft respectively provide new insights into the fundamental plasma processes responsible for the observed radio emission. I will discuss several recent new observational results, such as multipoint measurements of terrestrial Z-mode and X-mode emission observed near cavity boundaries, Kronian whistlermode emission triggered by upward parallel electron beams, and SKR driven by unstable electron distributions remarkably similar to terrestrial AKR. I will summarize the differing magnetosphere environments and how they influence the plasma processes which couple free energy from unstable electron phase distributions to radiation. I will conclude with a list of open questions which are still unresolved.