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Modulation of EMIC Waves by Plasma Plumes and Pc5 ULF Waves

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Electromagnetic ion cyclotron (EMIC) waves play an important role in contributing to localized ring ion current loss during geomagnetic storms, and radiation belt MeV electron losses. It is therefore important to understand the magnetospheric conditions under which EMIC waves are generated and propagate. GOES and POLAR satellite observations show EMIC waves associated with extended plasma drainage plumes in the plasmasphere and magnetosphere. The properties of EMIC waves seen by the fluxgate magnetometer onboard the CRRES elliptically orbiting satellite will be presented with emphasis on the relationship between EMIC waves and associated plasma drainage plumes observed in the CRRES plasma wave experiment electron density data and LANL satellite thermal energy plasma data. In particular wave generation by ring current ions and cold plasma propagation mechanisms by which Pc5 mixed mode ULF waves may modulate EMIC waves will be considered in detail.

Keywords: Magnetosphere dynamics, Plasma waves and instabilities, Space plasma physics