

ELECTROMAGNETIC ION CYCLOTRON WAVES ASSOCIATED WITH PLASMA DRAINAGE PLUME GRADIENTS AND GEOMAGNETIC STORMS

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It is known that electromagnetic ion cyclotron (EMIC) waves make an important contribution to localized ring current loss during geomagnetic storms, and also radiation belt electron losses. More recently it has been shown that EMIC waves observed by the GOES and POLAR satellites are associated with extended plasma drainage plumes seen in the plasmasphere and magnetosphere by the IMAGE-EUV instrument, and supported by LANL geostationary satellite thermal energy plasma data. In this study we will investigate the properties of EMIC waves seen by the fluxgate magnetometer onboard the CRRES elliptically orbiting satellite during pre-storm quiet times, and the main and recovery phases of geomagnetic storms. Also considered is the relationship between EMIC waves and associated plasma drainage plumes observed in the CRRES plasma wave experiment electron density data, LANL satellite thermal energy plasma data, and the role of Pc5 mixed mode ULF wave modulation often seen in association with the EMIC waves. Two individual case studies and statistics over 24 selected storms will be presented. The results will provide new results on conditions in the magnetosphere under which EMIC wave generation occurs.

waves, plasmasphere, geomagnetic storms

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