

Title: A Statistical Study of Modulation of Electromagnetic Ion Cyclotron Waves Observed on Ground

Speaker: Aditi Upadhyay

Abstract: Electromagnetic ion cyclotron (EMIC) waves play an important role in the precipitation of relativistic electrons from the outer radiation belt to the upper atmosphere. Thus, it forms an important component of magnetospheric research. The modulation of the EMIC waves by different geomagnetic pulsations is known to us from both ground and satellite observations. It is believed that the modulation of the EMIC wave is governed by the modulation of the source region ambient plasma parameters by the ULF geomagnetic pulsations. Therefore the modulation periodicities may be linked to the EMIC wave characteristics. We have reported a statistical analysis of the modulation of EMIC waves by short and long periodicities at the Indian Antarctic station, Maitri ($L \approx 5$). We have analyzed the induction coil magnetometer data for 2011–2017 and identified 6,845 EMIC wave events, out of which 5,502 events (80%) clearly showed the presence of short-period modulation. These short-period modulations are associated with repetitive rising-tone EMIC wave emissions. Among these 5,502 EMIC wave events, only 2,413 events showed the presence of long-period modulation in addition to short-period modulation. We have validated the observed trends using nonlinear theory. Such a study is important to improve our understanding of EMIC wave modulation. In this presentation, I will discuss this study's results.