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The interaction of comets with the solar wind is dominated by the ionization and subsequent pick-up of cometary neutrals. Non-thermal particle phase space distributions are caused by this pick-up process, leading to the generation of a plethora of low-frequency plasma waves. Wave properties are strongly dependent on the activity level of the comet as well as the size of the interaction region. Here we present first observations of the Rosetta magnetometer experiment, taken during the approach of the spacecraft to the comet. As cometary activity during this pre-landing phase is still low, low-frequency plasma waves will be of a different nature than compared to those already observed at active comets like 21P/Giacobini-Zinner, 1P/Halley, 26P/Grigg-Sjkellerup, or 19P/Borelly. Detailed comparisons of plasma wave characteristics will be discussed partly based on a newly developed analysis tool, the Rosetta Automatic Wave Analyses (RAWA) tool.

Gokani, Sneha

Low Latitude Whistlers: Correlation with conjugate region lightning activity and arrival azimuth determination

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The propagation mechanism of low latitude whistlers has puzzled the scientific community for many years. One of the key to the solution is to find the characteristics of whistler source location. The present study focuses on the correlation of ~ 2000 whistlers recorded for a period of one year (December 2010 to November 2011) using AWD-AWESOME VLF receiver system at Indian low latitude station, Allahabad (Geomag. lat. 16.79° N; L=1.08) with the lightning activity detected by World Wide Lightning Location Network (WWLLN) at and around the conjugate region (9.87° S; 83.59° E). About 63% of whistlers are correlated with the lightning strikes around conjugate region. To confirm the source region of whistlers, arrival azimuths of whistler causative sferics are determined and they are found to point towards the conjugate region. Most of the whistlers are found to be generated from the lightning strikes which are located in the thunderstorm with movement aligned in South-East direction. Moreover, the seasonal variations in spatial and temporal occurrence of whistler and lightning activities have been examined. Winter months, December, January and February are found to be dominant for the whistler activity. An inspection on the energy values of the WWLLN detected lightning strokes and whistler producing WWLLN detected lightning strikes led to a linear relationship between the two. A special focus is also given on the analysis of spectral features of low latitude whistlers by analysing the Power Spectral Density and Amplitude. The results obtained open a new window to look for the propagation mechanism of low latitude whistlers.

Hartinger, Michael

The effect of magnetopause motion on fast mode resonance

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The Earth's magnetosphere supports several types of Ultra Low Frequency (ULF) waves; these include trapped fast mode waves often referred to as cavity modes, waveguide modes, and tunneling modes/virtual resonance. All trapped fast mode waves require a stable outer boundary to sustain wave activity. The magnetopause, usually treated as the outer boundary for cavity/waveguide modes in the dayside magnetosphere, is often not stable, particularly during geomagnetic storms. We examine how magnetopause motion affects the magnetosphere's ability to sustain trapped fast mode waves on the dayside using idealized simulations obtained from the BATSRUS global magnetohydrodynamic (MHD) code. We present the first observations of cavity modes in BATSRUS, replicating results from other global MHD codes. We further show that for most solar wind conditions magnetopause motion negligibly affects fast mode resonance; other mechanisms are responsible for the observed low cavity mode