Geo-location and propagation features of very low latitude whistlers (L=1.08)

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The purpose of this study is to establish the source location and study the propagation characteristics of whistlers observed at Allahabad, Indian low latitude station (L=1.08). Whistler data set used is for the period of one year (Dec, 2010 to Nov, 2011). Total of 15 whistler activity days were found with ∼2000 whistlers, out of which GLD360 and WWLLN was able to detect ∼65% of causative lightning discharges in the vicinity of conjugate region. The dispersion of observed whistlers is found to be ∼12 $sec^{1/2}$. To emphasize the correlation with lightning data, arrival azimuths of the observed whistlers are determined. We observed ∼73% of whistlers whose arrival azimuths were found to match closely with that of causative sferics detected by GLD360 and WWLLN, with difference of ∼2°. The L-shell parameter is also calculated and found to be in the range of ∼1.14. GLD360 and WWLLN detected lightning strikes are also inspected for their energy values and it is observed that 30 kA/100-2000 J energy threshold is needed to trigger the whistler activity at low latitudes. The seasonal variation of observed whistlers leads to the highest activity in winter months followed by equinox months. No whistler activity is detected in summer, which in turn increases the importance of dependence on lightning activity in conjugate region. With a close look to the results, the source region of the observed low latitude whistlers is found near conjugate region and possibility of ducted mode of propagation through the low latitude ionosphere.

Plasmaspheric electron densities and plasmasphere-ionosphere coupling fluxes

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The Automatic Whistler Detector and Analyzer Network (AWDANet) is able to detect and analyze whistlers in quasi-realtime and can provide equatorial electron density data. The plasmaspheric electron densities and ionosphere-plasmasphere coupling fluxes are key parameters for plasmasphere models in Space Weather related investigations, particularly in modeling charged particle accelerations and losses in Radiation Belts. The global AWDANet detects millions of whistlers in a year. The system has been recently completed with automatic analyzer capability in PLASMON (*http://plasmon.elte.hu*) project.It is based on a recently developed whistler inversion model,that opened the way for an automated process of whistler analysis, not only for single whistler events but for complex analysis of multiple-path propagation whistler groups. In this paper we present the first results of quasi-real-time runs processing whistlers from quiet and disturb periods. Refilling rates, that are not yet known in details are also presented for the various periods.