VIII SERBIAN CONFERENCE ON SPECTRAL LINE SHAPES IN ASTROPHYSICS
6-10 June 2011, Divčibare, Serbia
Book of Abstracts, Eds. L. Č. Popović, D. Jevremović and D. Ilić
Astronomical Observatory Belgrade, 2011

Poster

VLF REMOTE SENSING OF THE LOWER IONOSPHERIC DISTURBANCES PRODUCED BY SOLAR FLARES AND PRECIPITATION OF ENERGETIC ELECTRONS

D. M. Šulić[1], V. Žigman[2], A. M. Nina[1] and V. A. Srećković[1]

[1] *Institute of Physics, Belgrade University, Pregrevica 118, Zemun, 11080 Belgrade, Serbia*
[2] *University of Nova Gorica, Vipavska cesta 13, 5001 Nova Gorica, Slovenia*
E-mail: dsulic@ipb.ac.rs

Very Low Frequency (VLF) radio signals (3-30 kHz), from both man-made and natural lightning, propagate in the waveguide bounded by the Earth's surface and the D-region of the ionosphere. Disturbances in the D region of ionosphere, which are manifested as electron density and temperature changes, cause significant changes in propagating of VLF waves in the earth-ionosphere waveguide. Simultaneous VLF phase and amplitude measurements made over different paths, are used to determine the enhancements in D region electron densities as a function of solar X-ray flux (measured on the GOES satellites) during a wide variety of solar flares occurred in period 2004 -2011.Lightning-induced electron precipitation (LEP) is a well established means of loss of the trapped belt electrons caused by resonant whistler wave-particle interactions. Ground-based VLF remote sensing yields information about the night-time D region conductivity altered by the enhanced secondary ionization produced by precipitating energetic electrons. Signals from five or eight VLF transmitters were recorded on ELF/VLF receiver systems at Belgrade station during period from 2004. The observed VLF amplitude and phase perturbations are simulated by the software package 'Long-Wavelength Propagation Capability' (LWPC) using Wait's model of the lower ionosphere. With these simulations we can detemined the sharpness and reflection height which are used for calculating of electron density height profile $N_e(h)$ in D-region during disturbances.