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Plasmaspheric electron densities: the importance in modelling radiation belts and in SSA operation

János Lichtenberger (1,2), Anders Jorgensen (4), Dávid Koronczay (1,2), Csaba Ferencz (1), Dániel Hamar (1), Péter Steinbach (3), Mark Clilverd (5), Craig Rodger (6), Lilla Juhász (1), Dmitry Sannikov (7), and Nina Cherneva (7)

(1) Eötvös University, Department of Geophysics and Space Sciences, Budapest, Hungary (lityi@sas.elte.hu), (2) Geodetic and Geophysical Institute, RCAES, Sopron, Hungary, (3) Research Group for Geology, Geophysics and Space Sciences, HAS, Budapest, Hungary, (4) Electrical Engineering Department, New Mexico Institute of Mining and Technology, Socorro, USA, (5) British Antarctic Survey, Cambridge, United Kingdom, (6) Department of Physics, University of Otago, Dunedin, New Zealand, (7) Institute of Cosmophysical Research and Radio Wave Propagation, Paratunka, Russia

The Automatic Whistler Detector and Analyzer Network (AWDANet, Lichtenberger et al., J. Geophys. Res., 113, 2008, A12201, doi:10.1029/2008JA013467) is able to detect and analyze whistlers in quasi-realtime and can provide equatorial electron density data. The plasmaspheric electron densities 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 network operates since early 2002 with automatic whistler detector capability and it has been recently completed with automatic analyzer capability in PLASMON (http://plasmon.elte.hu, Lichtenberger et al., Space Weather Space Clim. 3 2013, A23 DOI: 10.1051/swsc/2013045.) Eu FP7-Space project. It is based on a recently developed whistler inversion model (Lichtenberger, J. J. Geophys. Res., 114, 2009, A07222, doi:10.1029/2008JA013799), 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.
The network operates in quasi real-time mode since mid-2014, fifteen stations provide equatorial electron densities that are used as inputs for a data assimilative plasmasphere model but they can also be used directly in space weather research and models.
We have started to process the archive data collected by AWDANet stations since 2002 and in this paper we present the results of quasi-real-time and off-line runs processing whistlers from quiet and disturb periods.
The equatorial electron densities obtained by whistler inversion are fed into the assimilative model of the plasmasphere providing a global view of the region for processed the periods