Geophysical Research Abstracts,
Vol. 10, EGU2008-A-08423, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-08423
EGU General Assembly 2008

Propagation analysis of partial-hop whistlers recorded by DEMETER in comparison with ground-based data

O. Santolik (1), M. Parrot (2,3), U.S. Inan (4)

(1) Institute of Atmospheric Physics AS CR, Boční II 1401, Praha 4, Czech Republic; also at Charles University in Prague, Faculty of Mathematics and Physics, V Holešovičkách 2, 18000 Praha 8, Czech Republic. (ondrej.santolik@mff.cuni.cz), (2) LPCE/CNRS, 3A Avenue de la Recherche, 45071 Orléans cedex 2, France, (3) University of Orléans, Château de La Source, Avenue du Parc Floral, BP 6749, 45067 Orléans cedex 2, France, (4) Space, Telecommunications and Radioscience (STAR) Laboratory, Packard Bldg Rm. 355, 350 Serra Mall, Stanford University,Stanford, CA 94305-9515, US.

We analyze measurements of the DEMETER spacecraft related to lightning activity. At approximately 700 km of altitude, we observe 3D waveforms of the electric and magnetic fields of partial-hop whistlers. At the same time the corresponding spherics are recorded by a Very Low Frequency (VLF) ground-based station located in Nançay (France). The source lightning strokes are also identified by the METEORAGE lightning detection network. We thus know what are the positions and parameters of the lightning sources of the whistler mode radiation observed by DEMETER. We perform multidimensional analysis of the unique DEMETER measurements and we obtain detailed information on wave polarization characteristics and propagation directions. We then use a backward ray-tracing technique to estimate exit points of the partial hop whistlers from the ionosphere and to compare them with positions of the source lightning strokes. This allows us to characterize how the radiation penetrates through the ionosphere.