



## **Ionospheric conductivity effects on electric field penetration into the ionosphere**

M. Ampferer (1), V.V. Denisenko (2), M.Y. Boudjada (3), H.K. Biernat (1,3,4), K. Schwingenschuh (3), R. Döller (1), H. Lammer (3), G. Stangl (5), M. Stachel (3), and S. Krauss (3)

(1) Department of Geophysics, Astrophysics and Meteorology, KF University Graz, Austria, (2) Institute of Computational Modeling, Russian Academy of Sciences, Siberian Branch, Russia, (3) Space Research Institute, Austrian Academy of Sciences, Graz, Austria, (4) Institute of Physics, Department of Theoretical Physics, KF University Graz, Austria, (5) Federal Office of Metrology and Surveying, Vienna, Austria

It is well known that lithospheric electromagnetic emissions are generated before earthquakes occurrence. In our study we consider the physical penetration mechanism of electric field from the earth's surface, through the atmosphere ionosphere layers, and until its detection in space by satellite. A simplified approach is investigated using the electro conductivity equation, i.e.  $\nabla \cdot (\hat{\sigma} \cdot \vec{\nabla} \Phi) = 0$ , in the case of a vertical inclination of the geomagnetic field lines. Particular interest is given to the conductivity profile near the ground and the electric field distribution at the earth's surface. Our results are discussed and compared in particular to the pre-seismic electromagnetic observations reported by DEMETER micro-satellite.