Inversion of ground magnetic data to estimate ionospheric currents

Akimasa Ieda[1]; Yohsuke Kamide[2]

[1] STEL, Nagoya Univ.; [2] RISH, Kyoto Univ

http://st4a.stelab.nagoya-u.ac.jp/~ieda/

A geomagnetic inversion method to estimate ionospheric currents and the corresponding electric potential will be discussed. The earth's ionosphere (100km altitude) can be described by Ohm's law (relating electric current, conductance, and electric potential). The ionosphere thus can be modeled with the input ionospheric current and conductance. Since the ionospheric current is not directly observed, the ground magnetic field data is used instead. The ground magnetic field data contains information from both ionospheric currents and other source currents. It is thus necessary to take the rotation of Ohm's equation to model the ionosphere. We will focus on how to spatially interpolate the ground magnetic field data. Currently, we require that the Laplacian of the magnetic potential at the ionospheric altitude be as low as possible.