



Radiomagnetotelluric measurements on the ground and on board airplanes

L.B. Pedersen

Uppsala University (laust.pedersen@geo.uu.se / Fax: +46 18 50 11 10 / Phone: +46 18 471 2385)

Standard VLF (Very Low Frequency) measurements is a popular tool for fast reconnaissance mapping of electrically conductive zones in the upper crust and sedimentary cover such as lateral variations in lithology from sand to clay or fracture zones in the basement proper. They are popular because they are fast and relatively easy to interpret. We have further developed the VLF technique by using all the available radiotransmitters simultaneously whereby it becomes possible to map complicated 3D structures, either qualitatively or quantitatively by 3D inverse modeling. We have also extended the method such that in addition to the three magnetic components we also measure the two horizontal electric components at all measurement points in a wide frequency band 1-250 kHz. By this RMT (RadioMagnetotelluric) technique the depth resolution and depth penetration are markedly improved. We will show examples of the new maps that can be obtained from airborne VLF measurements over crystalline basement in Sweden. We will also show examples of 5-component RMT measurements for more detailed studies of areas with fractured granites and limestones. Fractured limestones from Gotland appear to be anisotropic in electrical conductivity.