

3-D IMAGING OF MID-MANTLE CONDUCTIVITY BASED ON INVERSION OF GROUND-BASED C-RESPONSES

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We present an inversion scheme for recovery of three-dimensional (3-D) distribution of mantle conductivity from a global observatory data set. It exploits quasi Newton optimization method, along with accurate 3-D forward problem solver, based on volume integral equation approach. An adjoint approach is used to calculate efficiently gradients of the misfit. In support of the efficient gradient calculation, explicit forms for elements of Green's tensors of magnetic type have been derived.

In order to utilize our 3-D inversion we prepared a set of C-responses in the period range between 2 and 220 days for 57 mid-latitude (dipole latitude below 55 deg) geomagnetic observatories using Z:Y method. C-responses are obtained by analysis of eleven years (1995-2005) of hourly mean data.

We invert these C-responses to try to resolve large-scale (thousands of km laterally) electrical conductivity structures at the depths 410 – 1500 km.

Conductivity, inversion, C-response

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