

Magnetotelluric survey in some active tectonics areas

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Abstract: The magnetotelluric (MT) method is an electromagnetic method based on the joint analysis of electric and magnetic fields through their ratio that define the MT impedance. This method has been intensively used in mineral exploration and crustal studies because of its sensitivity to conductivity contrast of rocks. The MT method is useful for delineating large-scale conductive and resistive zones within the earth. It is used for identifying structure related to juxtaposed rocks with differing resistivities, caused by differing rock types, fluid content or alteration within relatively uniform strata, and representing significant features such as partial melts, feeder dykes, structural features like faults and shear zones, magma chambers, etc. Because the method is sensitive to electrical resistivity, it offers an alternative and complementary exploration tool to seismic and gravity surveying and can be used for identifying structures that are generally undetectable by other techniques.

I will talk about resistivity structure sections obtained by MT surveys in some tectonic areas such as:

1. Arc-arc collision area in Hokkaido, Northern Japan.
2. Crust strain concentration area in Central Japan.
3. Three types of tectonic areas in Indonesia.

The heterogeneous electrical features in tectonic areas show a close spatial relationship with the distribution of the displacement rate and with seismicity. This suggests that the resistivity structure can be used as an index from which to evaluate the deformation characteristics of the crust.

