

CALCULATION OF PIEZOMAGNETIC FIELDS DUE TO UNIFORM REGIONAL STRESSES IN THE INHOMOGENEOUSLY MAGNETIZED CRUST

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A simple procedure for calculation of piezomagnetic fields due to uniform regional stresses in the heterogeneously magnetized crust is proposed. There is a prominent similarity between spatial distributions of anomalies in the geomagnetic total force values due to magnetization structures in the Earth's crust and those due to the piezomagnetic signals arisen from there. This similarity enables us to compute the piezomagnetic field due to uniform regional stress without determination of explicit structure of the magnetization intensities in the crust. The situation is quite similar to that of "reduction to the pole", which is often use for interpretation of magnetic survey data. We give an explicit formula that gives the 2-D spectrum of the piezomagnetic field from that of local magnetic anomalies, and applied the formula to a synthesized data. Obtained values are compared with the exact solution of the piezomagnetic field in order to check the efficacy of the novel method, and it is verified that the calculation by using the formula gives values precise enough for practical use.

piezomagnetic effect, regional stress, reduction to the pole

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