

Magnetic structure derived from magnetic potential-application of three component geomagnetic fields

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The magnetic structure is derived directly from the magnetic potential obtained from three component geomagnetic fields. The 3D Fourier transform is used to get the magnetic structure under assumption of its shape and the direction of magnetization. Generally the distribution pattern of magnetic field gets more complex than that of the potential, then the Fourier transform and its inverse transform are easy and accurate for the potential pattern. The magnetic potential is calculated from three component geomagnetic fields, however, in the area outside of magnetic source, the Laplace equation holds for the magnetic potential, then the independent fields are not 3 components but two. The magnetic potential in the area can be obtained as the boundary value problem. The magnetic potential on the boundary is obtained from three(or two) component geomagnetic fields, not from only one component which means that from one component of geomagnetic field, we cannot determine the other component. 3D Fourier transform shows the effect of 3D topography of magnetic source for upward/downward process, and the limit of fault layer assumption.