

Magnetic field distribution nearby high-conductive semi-infinite layer

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Magnetic field pattern produced by linear electric current nearby the boarder of high-conductive semi-infinite layer is considered for external media's conductivity being efficiently less than the layer's one. Assuming fixed layer's configuration we applied conformal mapping technique to evaluate field components anywhere in the plane for different source position. Two critical cases are under consideration.

In the short-wave approximation the wave-length has been assumed to be commensurable with the thickness of the layer. This case is characterized by periodically-vortical magnetic field structure enclosing conductive layer from three sides.

In the long-wave asymptotic a semi-infinite plate with zero-thickness was examined instead of the layer. The pattern of the field as well as the ratio between magnetic field components for this case have been designed also. This ratio can be applied for location of geomagnetic pulsations' source by comparing with the field distribution really obtained.