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Response characteristics of GREATEM system considering a half-space model

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ABSTRACT

The GRounded Electrical source Airborne Transient EM (GREATEM) system employs a cable transmitter on the ground and an airborne receiver coil flown below a helicopter. In comparison to other helicopter borne TEM (heli-TEM)systems, the main advantage of the GREATEM system is that it does not fly a large transmitter loop that makes the payload heavier and the survey logistics more rigorous, and expensive. The possibility to apply a large source moment (long cable and high amplitude current) facilitates recording good S/N ratios even at relatively higher flight altitudes(>100m). Also, the long duration pulses (1 cycle lasting 1.6 sec) and all time measurements make it possible to obtain reliable late time (> 20 msec) signals to probe greater depths. We have studied the response characteristics of the GREATEM system considering a half-space model.

The resistivity of the half-space is varied over a wide range to represent various types of geological terrains and rock types. The study reveals the range of resistivity values (resistivity aperture) which can be resolved well by the GREATEM system. The influence of varying the flight height and the distance of the source cable is also studied. Due to the deployment of grounded source, the GREATEM survey area is confined to a few tens of square km in the vicinity of the source cable. However, comparisons with other heli-TEM and ground TEM systems clearly bring out several advantages of the GREATEM system.

キーワード: Helicopter borne TEM (Heli-TEM), Deep penetration Heli-TEM, Grounded source Heli-TEM, Helicopter borne LOTEM
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