

Improvement test and field application applicability of airborne electromagnetic survey using drone

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Drone aerial electromagnetic survey method installs a transmission source on the ground and measures the induced magnetic field with a drone. The depth that can be investigated was up to 200 m in measurements so far. Drone airborne electromagnetic survey method can be applied to wide area survey in the future due to drone performance improvement. As a result, we carried out an improvement test of the exploration device and a field application test.

The device uses an induction coil as receiver, but the specification of the coil cannot measure the low frequency from the deep underground due to the restriction on the drone's operation. Therefore, we conducted experiments in Kusatsu-machi, Gumma Prefecture, using Magneto-Impedance (MI) sensors that can measure low frequencies. Experiment result confirmed that the MI sensor can measure the induced magnetic field from the drone.

Also, in order to know the limit of measurement using the induction coil, data was taken at a point about 900 m away from the transmission source. As a result, although it was measured on the ground, the induced magnetic field could be measured at a point of 900 m from the transmission source, and the depth of survey was 600 m.

It was confirmed that the drone airborne electromagnetic survey method could possibly be applied to deep survey in wide areas without using helicopters in the future. It is expected that the cost of the survey cost can be reduced, so that airborne electromagnetic survey can be utilized easily at more sites.

Keywords: airborne electromagnetics, drone airborne electromagnetic survey, drone, MI sensor