

Case study of Helicopter-borne electromagnetic survey for shear zone in the Mikabu belt

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It is necessary to develop the Hazard map with high accuracy for the prevention of the landslide disaster. We paid attention to the resistivity as a disaster factor of the ground, because the resistivity of the ground changes according to the water content and the clay content, and suggests the stability of the ground. Then, we are examining the applicability of the airborne electromagnetic method which can explore a wide area efficiently to the landslide disaster investigation (Nakazato et al., 2004; Konishi, 1998).

In this study, we conducted the helicopter-borne electromagnetic survey for the hazard assessment of the large-scale landslide located in the Sanbagawa metamorphic belt and Mikabu belt in the Shikoku district, western Japan. As a result, the apparent resistivity map of 1,100Hz showed a low resistivity part elongated from east to west. This low resistivity zone corresponded to the swelling green rock in the construction of the drainage tunnel for the landslide prevention, and was presumed to be a shear zone in the bedrock. The tunnel route was $V_p=4\text{km/s}$ layer according to the seismic exploration conducted before construction. In the seismic exploration, swelling rock mass was not predictable. In the direction where this low resistivity zone was extended, the swelling green rock was confirmed also in other tunnels. The resistivity survey by HEM is effective to the grasp of the shear zone in the Mikabu green rock distribution region.

References

Konishi(1998):Butsuri-tansa, 51, 643-658.

Nakazato et al. (2004): Tech. Rept. NIRE, 202, 197-204.