

Effective towed receiver offsets for controlled-source electromagnetic survey for imaging both seafloor and embedded massive sulfides

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SUMMARY

Deep-sea massive sulfides not only manifest as seafloor massive sulfides but also occur as embedded massive sulfides. Marine controlled-source electromagnetic (CSEM) methods prove effective for investigating these massive sulfides due to their lower electrical resistivity compared to the surrounding host rock. In our previous study (Ishizu et al., 2022), we demonstrated that a CSEM survey using a towed electric dipole transmitter with two types of receivers—stationary ocean bottom electric and towed receivers—can map both seafloor and embedded massive sulfides. Our investigation employed short-offset towed receivers with transmitter-receiver offsets less than 160 meters. In contrast, other studies have used towed CSEM systems with varying receiver offsets to explore deep-sea massive sulfides. Therefore, this presentation discusses the effective offset of towed receivers, using examples from hydrothermal deposits located shallower than 200 meters.

Keywords: Controlled source electromagnetics (CSEM), Deep-sea massive sulfide, Okinawa Trough

Keiichi Ishizu, Takafumi Kasaya, Tada-Nori Goto, Katsuaki Koike, Weerachai Siripunvaraporn, Hisanori Iwamoto, Yoshifumi Kawada, and Jun-ichiro Ishibashi, A marine controlled-source electromagnetic application using towed and seafloor-based receivers capable of mapping seafloor and embedded massive sulfides, *Geophysics* 2024 89:3, E87-E99
