

MIS007-10

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## Hydraulic test around a fault in Kamioka mine

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A new hole was drilled into a fault (the Southwest fault) in Kamioka mine, Gifu prefecture, central Japan. Primal target of the borehole is to develop relevant method to determine hydraulic properties of a fault, which usually difficult to measure, by examining hydraulic properties of a fault obtained from several methods such as in-situ hydraulic test, estimation from logging data, core image and measurement, and long term monitoring.. The borehole is vertical with total depth of 23.5 m, and diameter of 98 mm. The host rock of the formation around borehole is gneiss. The borehole penetrates the fault from around the interval between 19.5 m and 23.1 m. Sharp boundary was observed at around depth of 19.5 m and intensively crushed zone with small amount of clay continues to 23.1 m. A small and thin crack is observed around 8.9 m. The core is recovered for all the depth of the borehole. An obtained optical borehole image of the borehole, and ultrasonic velocity log are also obtained. We carried out a series of hydraulic tests using packers just after the drilling. To measure hydraulic properties of the fault, we made a single packer test that isolates the interval below 19.0 m by a packer. To obtain the hydraulic properties of host rock and the small crack, we made dual packer tests that isolate intervals of 13.9-15.1 m and 8.3-9.5 m using two packers. We also measure the water level change during each test, which provide another estimate of hydraulic properties of the fault. Preliminary estimate of permeability from water level measurement is  $2 \times 10^{-15} \text{ m}^2$ . The permeability of the host rock is three orders of magnitude larger than that of the fault. The small crack at about 8.9 m exhibits permeability between those of the fault host rock. This large deference in permeability between the fault and host rock suggests that the fault serve as a channel of fluid flow in the surrounding region.

Keywords: permeability, fault structure, logging, downhole measurement, Kamioka mine