

Hydraulic properties around a fault ?outline of a test at Kamioka mine

Hisao Ito^{1*}, Yasuyuki Kano², Masataka Kinoshita¹

¹JAMSTEC, ²DPRI, Kyoto Univ.

It is not always easy to estimate in-situ physical properties, especially hydraulic properties. We started a project to integrate the core-log-downhole experiment-long-term-monitoring integration to better estimate hydraulic properties related to faults. We selected the Kamioka mine, Gifu prefecture, central Japan for this research, mainly because we were sure we can reach to a distinct fault within a shallow depth. A new 25 m deep vertical borehole was drilled to penetrate a fault. We recovered all the core samples and logged with full wave sonic tool and optical television to identify the fault zone. We identified a major fault at 19.5 m and 23.1 m, which was consistent with estimated from existing data. Several fractures were also identified from the logging and cores. Water level during drilling operation suggested high permeability for the major fault at 19.5 m and 23.1 m. The fault zone at 19.5 m and 23.1 m is characterized by highly fractured gneiss with a small amount of clay from core inspection and high attenuation of sonic wave train. Other fault, where packer test was performed, has similar strike and dip as those of the fault zone at 19.5 m and 23.1 m. We conducted a series of packer tests, and we plan to measure core permeability, X-ray CT scan, and then long-term pressure/water level monitoring to integrate those data.

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