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Applicability of normalized pressure derivative plot for single hole hydraulic test in fractured rock

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In the fractured rock mass, the fracture and fracture domains are mainly pass through for groundwater. The connectivity of the fracture network is very important for the understanding the groundwater flow. At the oil development fields, derivative plot has been used for the analysis of oil well testing. In recent years, Enachescu (2004) presented the new derivative normalization method named "Transmissivity Normalized Plot" (TNP) for hydraulic test.

Since 2003, the Mizunami Underground Research Laboratory (MIU) is under construction by Japan Atomic Energy Agency (JAEA), in the Cretaceous Toki Granite in the Tono area, Central Japan. The conceptual design of MIU consists of two circular 1,000 m shafts (the 6.5 m diameter Main Shaft and the 4.5m Ventilation Shaft), and horizontal research galleries at depths of about 500 m and 1,000 m. JAEA has drilled many boreholes from the shafts and the gallery, and conducted the several single hole hydraulic tests.

In this study, we report the applicability of TNP for the single hole hydraulic test in fracture rock area using the MIU hydraulic test data.

Keywords: TNP, Derivative plot, Hydraulic test