

ICDP DSeis 2: Preliminary results of physical property measurement and XRD analysis of the M5.5 fault material recovered from DSeis Project

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Drilling into seismogenic zones of M2.0-M5.5 earthquakes in deep South Africa gold mines (DSeis Project) was undertaken in 2017–2018 near Orkney, South Africa, to understand principal mechanism of earthquakes nucleate and propagate. Drilling at two main holes, Hole A (817 m) and Hole B (700 m), was completed at the Moab Khotsong mine, and the latter hole penetrated the fault zone that slipped at the 2014 M5.5 earthquake. Fault-related material and its surrounding host rocks were successfully recovered from the hole, and the samples were analyzed in the Center for Advanced Marine Core Research, Kochi University, Japan. The main damaged zone is characterized by highly fragmented fault breccia with high amount of talc and amorphous material, which is likely to related to recent earthquake event. Nondestructive continuous measurements of physical properties (X-ray CT image, density, magnetic susceptibility, and natural gamma ray) are in progress. We will show the preliminary results about the characteristics of the M5.5 fault zone and its implication for generation of the M5.5 earthquake.

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