

Profiles of volumetric water content and related physical properties in the main fault zones retrieved from Hole B of TCDP

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Taiwan Chelungpu-fault Drilling Project (TCDP) penetrated two boreholes, Hole-A with maximum depth of 2000 m and Hole-B with 1350 m into the Chelungpu fault which slipped during the 1999 Chi-Chi, Taiwan earthquake (Mw 7.6). We measured volumetric water content using all the core samples retrieved from Hole-B (in a range from 950 m to 1350 m) by a non-destructive technique referred to as Time Domain Reflectometry (TDR). The result showed that the volumetric water content has a maximum value at the central portion consisting of black fault gouge in all the three fault zones. However, the disc-shaped black material is of lower porosity and showed lower volumetric water content. At the same Hole-B, conventional downhole logging (Natural Gamma-Ray, Resistivity, P-wave, Caliper) and Fullbore Formation Micro-Imager (FMI) were conducted. Distribution anomalies of the resistivity, P-wave velocity were recognized in all the three main fault zones. In addition, the electrical images obtained from FMI showed that the central portions of the fault zones are conductive.