

Chelungpu fault zone drilling and its outline results.

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The Chelungpu fault is a reverse fault with left lateral component dipping moderate to the east, which was activated in 21, September, 1999 Chichi earthquake ($M_w = 7.6$), with maximum vertical and lateral offsets of 5.6 m and 9.8 m. Characteristics of earthquake and related phenomena are contrasting between northern and southern regions along the Chelungpu fault. In the northern region, (1) larger displacements (4 to 9 m), (2) low frequency seismic waves with higher velocity of slip surface, and (3) less disasters except for the northern most area were observed in contrary to the southern region. The drilling penetrating into the Chelungpu fault was thus conducted at northern (Fengyan) and southern (Nantou) regions, and successfully completed in March 2001.

Meso- and microstructural examinations as well as measurements of static/dynamic physical properties have been conducted for each drilled core. The analyses are on the way half and producing interesting results, including (1) possible rupture zones activated at 1999 earthquake can be listed up by combining geological, geophysical logging and reflection seismic data, which are the fracture zones of 225 m and 330 m depths in the core from northern well and 177 m and 180 m fracture zones from southern well, (2) water contents of the core of the 225 m fracture zone in the northern well attains up to 45 vol.%, (3) fault rocks is mainly composed of random fabric fault breccia in the northern rupture zones at depth, whereas in the southern well, foliated fault breccia is dominated associated with ultracataclasite and pseudotachylite in the centralized layer along the 177 m fracture zone. (4) Some temperature rises are detected at 330 m fracture zone in the northern well and 180 m fracture zone in the southern well by temperature logging that was performed after drilling.