

Evaluation of the Pore Fluid Pressure at a Depth of 1111 Meters on the Chelungpu Fault During the 1999 Chi-Chi, Taiwan, Earthquake

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Abstract

On September 20, 1999, the Ms7.6 Chi-Chi earthquake ruptured the Chelungpu fault in central Taiwan. Based on a 1-D conduction equation and 2-D faulting model, the heat strength and fluid pressure state on the fault plane at a depth of 1111 m are inferred from the temperature rises measured in a deep hole cutting the fault plane and the thermal constants measured from the core samples. Results show the heat strength is 2.93 °C-m and the pore-fluid factor is 0.86. The latter leads to a pore fluid pressure of 20.6 MPa. This indicates the existence of a suprahydrostatic state at this depth on the fault plane during the earthquake.