

Piezoelectric measurements of natural rocks with atomic force microscopy

Tomonori Matsuda[1], Chihiro Yamanaka[2], Motoji Ikeya[3]

[1] Dept. of Earth and Space Sci., Graduate School of Sci., Osaka Univ, [2] Earth and Space Sci., Osaka Univ., [3] Earth and Space Sci. Osaka Univ.

Preseismic and coseismic electromagnetic phenomena have been globally observed by many researchers. The electromagnetic model of geological faults was suggested to explain most of phenomena. A piezoelectric coefficient of rock is important parameter to discuss these phenomena quantitatively. In this study, strain induced by alternating electric field was measured by commercially available AFM and lock-in amplifier. The piezoelectric coefficient was determined from the slope of the resulting displacement vs applied voltage plot. The coefficient up to 10-15 C/N can be measured in this method. The dielectric property can be discussed by the phase difference between the applied electric field and the displacement.

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