

## Investigation of "positive hole excitation" for stressed igneous rocks with a control of water content

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Piezo electric effects, positive hole excitation for stressed igneous rocks and streaming potential have been considered possible mechanisms that explain pre-seismic electric signals. Especially, positive hole excitation, (Freund et al. 2006), explains long-term anomalous electromagnetic signals and telluric current signals observed for a long distance, therefore attracts a lot of attention.

To clarify the mechanism of pre-seismic electric signals, we performed following experiments for stressed igneous rocks with saturated by water. Samples of granite and gabbro sized  $3 \times 3 \times 10$ cm. Then, the samples were loaded from 1.08MPa to 5.45MPa, with recording of water content. Current-flows from -40pA to -20pA and around -1.5nA were observed for granite and gabbro samples respectively, while any current changes were not observed from bone-dry rocks. These results indicate that pore water is closely tied to current changes. Samples with different size were also tested. The values of current-flow agree well with results of observation of pre-seismic anomalous telluric current signals in Kozu-shima Island (Orihara et al. 2012), assuming the resistivity 10-1000 $\Omega$ m.

### Reference

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