

Poroelastic behavior of bedrocks around Tono Research Institute of Earthquake Science

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Tono Research Institute of Earthquake Science (TRIES) has set up multi-component borehole instrument at 15 deep boreholes around 10km square area. In the boreholes water level meter have also installed. Japan Atomic Energy Agency (JAEA) has constructed deep boreholes with diameters of 6.5m and 4.5m and studied flow of ground water. Depth of the boreholes reached to 500 m. The boreholes are 40m apart and connected by horizontal tunnels at every 100m. We also have set up stress meters, water pressure meters and tilt meters in the horizontal tunnels. By this kind of observations we have recorded the following variations.

1. Variation by spring water and draining water.
2. Variation by seismic wave.
3. Variation by pumping water performed in a borehole
4. Variation by atmospheric pressure change.
5. Variation by boring work in boreholes.

By analyzing these variations we could clarify poroelastic characteristics of bedrocks around TRIES.
The main results obtained are as follows:

1. Construction of poroelastic model.
2. Difference between elastic variation caused by pore pressure variation and pore pressure variation caused by elastic variation.
3. Form and distribution of pore.
4. Variation difference at both side of fault.

We will report the details about these.

Keywords: Multi-component borehole instrument, stress, strain, tilt, water level, poroelastic behavior, stress and strain seismograms, movement of fault