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Movement of a fault arised by a pumping or a spring water and its understanding by poroelasticity -a case of NNW fault-

ISHII, Hiroshi[1*] ; ASAI, Yasuhiro[1]

[1]TRIES, ADEP

Tono Research Institute of Earthquake Science (TRIES) has developed a borehole stress meter for continuous observation and multi-component borehole instruments. At the present time about 15 borehole stations are in operation. We have investigated crustal movements and behavior of underground water by using data obtained from borehole observations. The depth of the deepest borehole is 1030 m.

Near TRIES, JAEA (Japan Atomic Energy Agency) is constructing deep boreholes with diameters of 4m and 6.5m. And depth is about 500m at the present time. The boreholes are 40m apart and connected by stages. NNW fault is running beside the 6.5m borehole. We are investigating a relationship between water flow and geophysical observations by using experiments of pumping water and spring water.

The main results obtained are as follows:

1. Water level of TGR350 borehole station decreases by pumping water and spring water. Data of the strain meters installed at 350m depth indicate right lateral movements of NNW fault.
2. Data of the strain meters installed at 350m depth indicate left lateral movements of NNW fault in case of recovery of water level.
3. Strain meters installed shallower depth (165m) and extensometers installed in sedimentary layer do not indicate such fault movements.
4. We have considered a mechanism explaining the phenomena by using poroelastic understanding.

We will present the details of observations and analyses.

Keywords: Deep borehole observation, Fault movement by spring and pumping water, Groundwater flow, Understand by poroelasticity, Continuously observable stressmeter