

## Volumetric strain change accompanying ground water level change at the Mikkabi station

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An anomalous change is observed in summer season every year at the Mikkabi volumetric strain meter. Accompanying the event, change in the ground water level is also observed. Takenaka and Yoshida (2000) showed that the pattern of the strain change is very similar to that of the differential of the ground water level.

First, the volumetric strain change starts as compression, and then, usually after several hours, tends to expansion. The relaxation time for the later phase is 15-20 hours and it does not depend so much on the amplitude. In the later phase the water level change is also approximated as a relaxation process, and the relaxation time seems a little bit longer than that for the strain change. The same good correlation is recognized between the strain change and differential of the ground water level for similar events in different years, but the correlation coefficient differs somewhat.

At the Mikkabi station another volumetric strain meter is installed at a distance of about 80m. Strain change is also observed at the strain meter, but pattern of the time sequence is not the same to that of the other one, which feature is considered to represent the difference of response of strain meters at different depth to the cause.

We think pumping of ground water at a far site is the cause of the phenomena. It produces pressure difference in the ground water, which brings about flow of the water as well as decrease in the pore pressure, that is, increase of the load to the rock in which the sensor of the volumetric strain meter is installed.