# Development of vertical extensometer and observation

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Extensometers used at the present time are mostly horizontal components. Vertical components are also important for geophysical study. We have developed a vertical extensometer. We employed quartz tube with 3 meter length, 60 mm diameter and 6 mm thickness as standard scale. We digged three meter depth borehole in Mizunami observation tunnnel. We fixed an end of the quartz tube at the bottom of the borehole. Mechanical enlargement system was put in the another end. Out put is a volt through the system equipped with magnetic displacement sensor.

The extensometer have been recording erth tides and strain seismograms well. We report the detail of the instrument and analysed results.