

Continuous observation of crustal deformation by using a laser extensometer at Tenryu-Funagira station

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Meteorological Research Institute is proceeding with the establishment of the laser extensometer length of which is several hundred meters at Funagira tunnel located in western part of Shizuoka Prefecture. 200 meters section of the extensometer was completed in December, 2007, so a tentative observation was started. In this report, some preliminary results of observed displacement data are described.

The laser extensometer is installed along the tunnel which runs north to south. A displacement measurement is based on the simple Michelson type interference method which used a He-Ne laser beam. The interference signal is converted into change of the optical distance between a beam splitter and a retro-reflector. Data observed for about a month from the beginning was analyzed by using of the tide analysis program BAYTAP-G (Tamura et al., 1991). Evaluated amplitudes of tidal strain were 0.5-0.8 as small compared with the predicted value which was computed by using the program GOTIC2 (Matsumoto et al., 2001). Because the observation period is too short at present to investigate characteristics of longer strain change, the following is indefinite as yet. A response factor to atmospheric pressure change was approximately -0.3 nano-strain/hPa. There was a precipitation of 30 mm in four hours in the observation period and then strain changes of 0.01 micro-strain were observed by the volumetric strainmeters around, but a conspicuous change wasn't seen by the laser extensometer.