

## Multi-component monitoring of crustal activities in the deepest borehole (1200m) in the world by a newly developed instrument

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A deep borehole with depth of 1200 m has been constructed. The borehole is located beside the Byobu-san active fault. This station composes a member of 3 dimensional array of crustal movements observation with other nearby stations consisting of five deep boreholes and a vault. We performed in-situ stress measurement at depths of 350 m, 700 m and 1200 m during excavation of the borehole by overcoring method, utilizing a wireless intelligent type strain meter developed by us.

Well loggings are also done in the borehole and various geophysical parameters are determined.

We finally install a newly developed multi-component instrument in the bottom of the 1200 m borehole. It can record data of 7 strain components (4 horizontal, 2 inclined and a vertical), 2 tilts, 3 seismic waves, 4 geomagnetisms and a temperature of high resolution. This is the deepest multi-component continuous monitoring of crustal activities in the world. Outputs obtained from the sensors are digitized and transmitted to a surface by using only one coaxial cable.

We will present the details of both the instrument and the observation system with interesting results obtained from the observations.