



## **Deformation, stress and seismicity induced by the large scale injection experiment at the KTB/Germany**

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In earthquake research and the associated accumulation of stress in the Earth's crust the role of fluids becomes more and more important, but the interaction of deformation, fluid migration and seismicity is still poorly known. Therefore, in a large scale injection experiment at the deep borehole-site KTB (Kontinentale Tiefbohrung der Bundesrepublik Deutschland) in Germany water was injected into the 4000m deep pilot borehole for ten months. The fluid induced stress changes caused a bulge which was detected by five high resolution borehole tiltmeters, as well as seismicity monitored by a local network. Numerical modelling of the deformation revealed an uplift of more than 3mm in the center of the investigation area above the injection point. The region of induced deformation is nearly identical with the region covering the induced earthquakes and a high correlation to the local fault structure is obviously. Thus, surface tilt observation in connection with numerical modelling proved to be a tool for the investigation of the geodynamic process. This procedure enables a more sophisticated geodynamic interpretation of coupled source processes, and the mayor target is the application in active tectonic and high risk areas.