

Changes in groundwater level due to the 2004 Off Kii-Peninsula earthquakes detected by the observation well network of AIST

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Groundwater level and flow rate at 56 wells are observed by Geological Survey of Japan and Shizuoka Prefectural Government for purpose of monitoring seismic and volcanic activities. The 2004 Off Kii-Peninsula earthquakes occurred southeast off the Kii Peninsula, Japan on September 5, 2004. We detected 47 and 49 changes in groundwater level or flow rate in relation to the earthquakes of the foreshock (M6.9) and main shock (M7.4), respectively. The coseismic changes were classified into three types; Type I: only oscillation, Type II: step-like change and Type III: gradual change. The step-like changes of Type II were related to the changes in the volumetric strain in the crust induced by the earthquakes. Using strain sensitivities of groundwater level, we could calculate volumetric strain changes from the step of groundwater level, and compared the theoretical strain from fault model with the calculated strain from the groundwater level. We could obtain a good liner correlation between the theoretical strain and calculated one from groundwater level, and we found that the two wells were good indicators of coseismic strain.