The relationship between gravity and pore water pressure variations at Mizunami, central Japan

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The Tono Research Institute for Earthquake Science (TRIES) has been measuring gravity using an FG5 absolute gravimeter located at the Mizunami Geoscience Academy (MGA) in central Japan, since January 2004. The measured gravity decreased immediately following the Earthquake offshore southeast of the Kii peninsula (September 5, 2004) by about 6 microGal. Near the MGA, the Japan Nuclear Cycle Development Institute has installed multilevel pore water pressure gages in several boreholes including one that penetrates a NNW trending, sub-vertical low permeability fault. The September 5, 2004 earthquake produced the greatest pore pressure rise observed. In this study, we attempt to elucidate the relationship between the pore water pressure change and gravity change. The following relationships are inferred: the pore water pressure change at depth correlates inversely with the gravity change, while the shallow pore water pressure change creates a positive correlation with a threefold increase in effect compared to the deeper region. In our presentatin, we will talk about more recent data.