

Relationship between co-seismic pore pressure changes and dynamic stress variations in borehole observation site at Tono region, Gifu, central Japan

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From December 2015 to August 2017, we observed 6 clear exponential pore pressure changes (co-seismic pore pressure changes) in response to dynamic stress variations associated with local and distant earthquakes at STG200N borehole observation site in Mizunami Underground Research Laboratory [e.g. The 2016 Kumamoto Earthquake (Mj7.3)].

We investigated the relationship between peak amplitude of co-seismic pore pressure changes and peak-to-peak amplitudes of dynamic stress variations (1st invariant). The following results were obtained: (1) there is a positive correlation between the observed amplitude of co-seismic pore pressure changes and peak-to-peak amplitude of dynamic stress variations. (2) co-seismic pore pressure changes in STG200N were caused by dynamic stress variations with peak-to-peak amplitude above a threshold between 1.478 kPa and 1.480 kPa (Asai et al., 2017).

We will present the details of these relationships between peak amplitudes of co-seismic pore pressure changes and peak-to-peak amplitudes of dynamic stress variations, and will evaluate the threshold of stress variations that caused the co-seismic pore pressure changes.

Keywords: co-seismic pore pressure changes, dynamic stress variations