Stress field from the bottom of the source region of the Tokai Earthquake to the deep slow-slip regions

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Detailed knowledge about a deep transition zone from an unstable- to stable-slip regime is essentially important to understand the stress concentration process to the source region of the mega-thrust interplate earthquake. We have conducted a very dense seismic observation in the Tokai-region from the April to the August in 2008 through a linear deployment of 75 portable stations. The array extended from the bottom part of the source region of the Tokai earthquake to the slow-slip regions including numerous deep low-frequency earthquakes.

Here we show several features of stress field in this area revealed by the dense seismograph deployment. We manually picked the polarities of P-wave first arrivals from each waveform for about 700 earthquakes. Then, we applied the HASH-code [Hardebeck and Shearer, 2002] to the data set, in order to estimate focal mechanisms of each earthquake. It is found that most of earthquakes at depths shallower than 20 km show strike-slip type with P-axis directed toward NW-SE. About a seismic swarm observed at Mori-town, focal mechanisms of each earthquake are fairly similar within the swarm. Alignment of the earthquakes in the swarm is almost parallel to one of the nodal plane of the focal mechanism. Within the slab, most of earthquakes show normal faulting at depths deeper than slow-slip regions, which indicates that the slab is pulled parallel to the direction of the subduction.

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