

Evaluation of the Present Stress Field for the Nankai area through the Slip DeFicit Model

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After the 2011 Tohoku-Oki, Japan, earthquake, many studies have investigated the stress state in the Nankai trough area, where is one of the possible area for the next devastating earthquake. For understanding the stress state and geological properties in Nankai, several drilling projects have been conducted in the shallow part of the Kumano and Shikoku basin. Among them, the Nankai Trough Seismogenic Zone Experiment (NanTroSEIZE) has involved in many studies on the stress orientation and magnitude estimation by logging datum in the Nankai Trough. Due to limitation by the technology and the processing of drilling, the real stress orientation and magnitude in Nankai near the subduction zones is still controversial. In this study, we develop the Slip DeFicit Model (SDM) to estimate the stress tensor and associated with the Fine-scale boreholes datum. SDM is assumed that the regional stress is dominated by the slip deFicit during aseismic period. The tectonic loading in the rest part of the system has been released through other aseismic behaviors, such as creeping or small earthquakes. Using this model, the stress tensor can be analyzed at different depths in the drilling sites. Comparing to the logging data, the modeled stress tensors in terms of magnitude and orientation are consistent with the stress states in the site C0009, C00012, C0002, and C0006. Based on SDM, the stress tensor at deeper depth in the drill sites can be evaluated.

Keywords: Slip DeFicit model, Nankai trough, stress tensor, subductiuon zone, logging