

## Spatial variation in size distribution of deep non-volcanic tremor in southwest Japan

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Magnitude-frequency distribution of ordinary earthquake satisfies the Gutenberg-Richter (GR) relation, indicating the size-frequency distribution satisfies the power law. The slope of semi-log graph of the GR law, b-value, is considered to reflect the stress state in earthquake source region. Size of deep non-volcanic tremor is estimated by the reduced displacement (RD) (Aki and Koyanagi, 1981) and their frequency distribution satisfies the exponential law (Hiramatsu et al. 2008). The slope of semi-log graph of this exponential law is very important when considering the friction property in the tremor source region on the subducting plate interface. In this study, we have investigated spatial variation in the RD-frequency distribution of tremor in southwest Japan. The result shows that the slope of RD-frequency distribution varies strongly from cluster to cluster. In each of the segment in western Shikoku, eastern Shikoku and Kii Peninsula, there exists a negative correlation between the observed slopes of RD-frequency distribution and the recurrence intervals of tremor activity: the larger the slope is, the longer the activity interval. In laboratory experiments, it has been shown that contact patches on friction surface grow and combine with time. The observed correlation might suggest time variation in the distribution of tremor patch size on the plate interface.

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