

Timescales of silica precipitation compared to the earthquake recurrences around seismogenic zones SW Japan

*Hanae Saishu¹, Makoto Otsubo¹, Atsushi Okamoto², Kohtaro Ujiie³

1. AIST, 2. Tohoku Univ., 3. Univ. Tsukuba

Quartz vein has been recognized widespread around seismogenic zones. Silica dissolution-precipitation could affect to the mechanical and hydrological properties of rocks and would have important roles on seismogenic zones. However, the relationship between formation of veins and earthquake recurrence is still not understood. We proposed the kinetic model to compare the timescales of quartz vein formation to that of the earthquake recurrences in 2 cases: the extensional quartz veins around the Nobeoka Thrust of SW Japan (Saishu *et al.*, 2017)¹, and the shear quartz veins around the Makimine mélange in the Late Cretaceous Shimanto accretionary complex of eastern Kyushu, SW Japan (Ujiie *et al.*, 2018)². In this study, we summarized the kinetics models of extensional/shear quartz veins and the range of timescales of quartz vein formation that depend on pressure, temperature, width and length of veins, and so on. In addition, our model would be applied to calculate the timescales of quartz vein formation around the western coast of Kii Peninsula, SW Japan.

1: Silica precipitation potentially controls earthquake recurrence in seismogenic zones, H. Saishu, A. Okamoto, M. Otsubo, *Scientific Reports*, 7, 2017

2: An Explanation of Episodic Tremor and Slow Slip Constrained by Crack-Seal Veins and Viscous Shear in Subduction Melange, K. Ujiie, H. Saishu, A. Fagereng, N. Nishiyama, M. Otsubo, H. Masuyama, H. H. Kagi, *Geophysical Research Letter*, 45, 11, 2018

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