9th FTSES 2024 Penghu, Taiwan

9th France-Taiwan Symposium in Earth Sciences
Session: Neotectonics/ Structural Geology/ Geomorphology

Extreme fragmentation of quartz – observation in nature and experiments

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Pulverized quartz, distinct from other fault rocks, was found within the fault zone in MiDAS Hole-A that has been characterized by the friable structure and severe fragmentation. Pulverization may reveal the dynamics of earthquake propagation, but the study of pulverization still remains lack in Taiwan. In this study, microstructural observation in naturally pulverized quartz is conducted and the mechanical experiments on synthetic quartz is performed to understand the condition and process of extreme fragmentation. Preliminary results show that naturally pulverized quartz has intensive intragrain fractures, no obvious shear deformation and no shear-induced amorphous phase. On the other hand, the mechanical experiments are still ongoing. Occurrence of pulverized quartz in Milun fault zone may shed light on the earthquake rupture process.

Keywords: Extreme fragmentation, Pulverization, MiDAS, Milun fault zone