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Characterization of carbonaceous materials in the Taiwan Chelungpu fault by micro FTIR-Raman spectroscopies

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Coseismic slip during an earthquake induces frictional heating in fault zone. Determination of the temperature recorded in the fault is important for estimating the dynamic shear stress and displacement during the earthquake. Here we performed micro FTIR-Raman spectroscopic analyses of carbonaceous materials from the Taiwan Chelungpu fault, which slipped at the 1999 Chi-Chi earthquake. We also conducted heating experiments and friction experiments and analyzed by FTIR-Raman spectroscopies in order to investigate the effects of fast heating rate like frictional heating during earthquake. Based on the results of analyses, we discuss the capability as new temperature proxy during the earthquake.

Keywords: Taiwan Chi-Chi earthquake, carbonaceous materials, FTIR spectroscopy, Raman spectroscopy