

Levels of frictional heat along deep to shallow parts of the megasplay fault : a Raman spectroscopic analyses of CM

MUKOYOSHI, Hideki^{1*} ; HIRONO, Tetsuro² ; MASUMOTO, Hirokazu²

¹Faculty of Education and Integrated Arts and Sciences, WASEDA University, ²Department of Earth and Space Science, Graduate School of Science, Osaka University

Estimation of frictional heating of deep to shallow portion of ancient megasplay fault is important for understanding of weakening mechanism (e.g., thermal pressurization, melt lubrication) of present plate boundary fault and megasplay fault. In this study, we performed microstructural observation and Raman spectroscopic analyses of carbonaceous materials (CM) in the fault rock of 2.5-5.5 km depth of an ancient megasplay fault (an out-of sequence thrust in the Shimant accretionary complex) and 1-4 km depth of a thrust in the Emi group, Hota accretionary complex. We also conducted heating experiment of CM in host rock of these fault with anaerobic condition (rate of temperature increase: 20 K/min) in order to investigate the effects of fast heating rate like frictional heating during earthquake.

Raman spectrum of CM of both fault is similar to spectrum of 400~600 °C heating experiment of CM. This result shows that both fault had heating history of 400~600 °C by frictional heating. Further examination for effect of shearing to molecular structure is needed for more detailed evaluation of frictional heating history.

Keywords: ancient megasplay fault, heating experiment