Japan Geoscience Union Meeting 2011
(May 22-27 2011 at Makuhari, Chiba, Japan)

SCG066-P02 Room:Convention Hall Time:May 22 14:00-16:30

Zircon thermochronology of fault zones:Case study of the Mozumi-Sukenobu fault, central Japan

Zuitetsu Ikuho[1*], Noriko Hasebe[2], Kunimi Yamada[4], Shigeru Sueoka[1], Masaki Murakami[1], Takahiro Tagami[1], Yumiko Watanabe[1], Ryuji Yamada[3], Shoji Arai[2]

[1]Kyoto University, [2]Kanazawa Uniiversity, [3]NIED, [4]JAEA

Quantitatively understanding of heat generation and transformation associated with faulting is a key to understand not only dynamics of faults but also heat budget, temperature structure and range records. To understand thermal history along faults, geologic thermometers such as thermochronometers, homogenization temperatures of fluid inclusions and vitrinite reflectances have been used. Zircon fission-track thermochronology has been one of the most powerful tools to reveal thermal history along faults (e.g., Murakami et al., 2004; Tagami and Murakami, 2007). Zircon fission-track thermochronology has advantages as below: (1) fission tracks are annealed only by heating, (2) zircon is physically robust and chemically stable and can occurs along fracture zones, and (3) short-term annealing kinetics of zircon fission tracks is well understood based on laboratory experiments.

In the Mozumi-Sukenobu fault, the strongest thermal anomalies were detected between two fracture zones identified in the tunnel by using zircon fission track methods. This secondary heating is attributed to ore deposit water probably sourced from the Kamioka mine on the basis of spatial distribution of ZFTand ZHe ages, numerical calculations using the 1-D thermal diffusion equation, geological observations and ZFT inversion calculations.

Keywords: thermochronology, fault, Atotsugawa fault group