G122-012 **Room: 202** **Time: May 20 15:00-15:15**

Elevation of the Sambagawa metamorphic rocks into the upper crustal level caused by pervasive D2-normal faulting

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Recent numerical simulation on channel flow in the Himalayan metamorphic rocks by Beaumont et al. (2004) has attracted much attention in this field. One of the important results is that the Himalayan metamorphic rocks tunnel through in midcrust and never extrude into the upper crustal level, if no denudation occurs and the upper crust is strong. On the other hand, the metamorphic rocks can be elevated in the way of thrust extrusion, doming by crustal extension, etc. by varying the denudation rate, and brittle and ductile strength of the upper crust. Accordingly, the rheological behavior of upper crust, in particular, faulting could control the elevation processes of metamorphic rocks into the upper crustal level.

T. Takeshita discovered in 1992 that conjugate sets of normal faults pervasively develop in the oligoclase-biotite zone along the Asemi-River, central Shikoku (Takeshita and Yagi, 2004). Yagi and Takeshita (2002) argued that a few units of metamorphic rocks in the biotite zone, which experience different pressure-temperature tome paths, are juxtaposed by faulting. The conclusion is based on remarkable spatial changes in the retrograde P-T path in the biotite zone, which is recorded in compositional zoning of amphibole from basic schist. Later, the existence of the inferred fault has been evidenced by the discontinuity in the spatial distribution of lineation orientation, recrystallized grain size of quartz and muscovite K-Ar ages (Yagi, 1999MS, 2002MS; Yagi et al., 2002, GSJ abstract; Takeshita and Yagi, 2004). Furthermore, El-Fakharani and Takeshita (in review) have documented that in the Niihama area 30 km far from the Asemi-River area in the strike (WNW) direction, similar conjugate sets of normal faults to those in the Asemi-River area develop. One important fact is that in the Niihama area, D3-folds also intensively develop with the wavelength of several tens of meters, the formation of which superposes on that of the normal faults. Hence, the conjugate sets of normal faults formed at the D2-stage.

Based on the orientations of striation or quartz slickenfibre, the normal faults in the Asemi-River and Niihama areas formed under the stress field of WNW-ESE and NNW-SSE trending and horizontal extension, respectively. Furthermore, since the normal faults, along which the upper plates move in the WNW and NNW directions in the Asemi-River and Niihama areas, respectively, are dominant, overall shear deformations in these directions are accommodated in these areas. The shear directions by D2-normal faulting are significantly different from those at the D1-stage, which is a top-to-the-west to WNW-ESE sense, and rather close to the normal direction to proto-southwest Japanese arc (N75^{o}E in the present orientation). The fact suggests that the D2-normal faulting is related with the gravitational collapse of stack of nappes formed by shortening tectonics, which enables the underlying metamorphic rocks to be exposed (e.g. Platt, 1986).

Finally, zircon fission track (FT) ages in two psammitic schist samples along the Asemi-River and Dozan-River, will be reported for the first time. Although these samples are collected from similar structural horizons, they have yielded very different FT ages. One from the Asemi-River yielded the FT age of 92.6+-6.2 Ma (13 grains), while the other from the Dozan-River yielded the one of 47.2 +-3.8 Ma (7 grains). Both of the FT ages pass the chi square test, and hence considered to be the reset ages. The former age (Late Cretaceous) is perhaps close to the age of peak-metamorphism of the chlorite zone (300 ^{o}C), while the latter FT age (Eocene) could indicate the age of D3-stage, because the D3-folds are intensively developed in the Dozan-River area. The result is also important to constrain the age of D2-normal faulting.