[JJ] Evening Poster | S (Solid Earth Sciences) | S-GL Geology

[S-GL31]Regional geology and tectonics

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The main aim of this session is to discuss geologic structure and tectonic history of East Asia, especially of Japanese Islands, on the basis of the recent results of geology and other earth sciences.

[SGL31-P17]Reexamination of the radiometric ages of the middle Miocene near trench magmatism in SW Japan

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In the middle Miocene time of the southwest Japan, widespread magmatism occurred in near trench region. The region of magmatism extends ca. 800 km along with SW Japan Arc, and up to 100 km in the across arc direction. It was almost contemporaneous with the clockwise rotation of SW Japan arc and the commencement of subduction of the young hence hot Shikoku Basin of the Philippine Sea plate beneath the SW Japan forearc sliver. Near trench magmatism can be divided into three types by the lithologies and the distance from the Nankai trench. Setouchi Volcanic Rocks in the Setouchi Geologic Province are composed of rhyolitic to dactitic rocks, calc-alkaline andesite including high-Mg andesite, and olivine tholeiite. Some of the felsic rocks with HREE depletion are assumed to be formed by melting of sediment on the subducting slab (Shinjoe et al., 2007). High-Mg andesite magma thought to be formed by reaction of the slab melt with mantle wedge peridotite (Tatsumi, 2006). In the Outer Zone of SW Japan are distributed Outer Zone Granitic Rocks including felsic to intermediate plutonic and volcanic rocks. Most of them are S-type felsic rocks formed by melting of deep part (ca. 20 km) of the accretionary complex (Shinjoe, 1997). Some of the igneous complexes ejected large scale ignimbrite and formed caldera. In the region closest to the Nankai trench, small igneous complexes and dikes are distributed, including the basaltic rocks both tholeiitic and alkaline affinities with or without felsic igneous rocks. Ages of these igneous rocks have been constrained mainly by conventional K-Ar and fission-track methods. The results of the dating range 10 to 17 Ma, so the igneous activities have been thought to generally contemporaneous with clockwise rotation of SW Japan Arc. However, more precise data are needed to constrain the tectonic environment of this short-lived peculiar magmatism. For example, to support the slab melting hypothesis of high-Mg andesite of the Setouchi Volcanic Rocks, magmatism should have taken place after the initiation of the subduction of the hot Shikoku Basin. We have conducted zircon U-Pb dating by LA-ICP-MS in the Earthquake Research Institute of the University of Tokyo for systematically representative igneous bodies in Kyushu, western Shikoku and Kii peninsula. Preliminary $^{40}Ar/^{39}$ Ar dating was also carried out at Potsdam University for zircon-free mafic lithologies. Based on the results of dating, we demonstrate the time-space distribution of the middle Miocene near trench igneous rocks in SW Japan. The overall results of our dating are as follows. (1) U-Pb ages of the Setouchi Volcanic Rocks and Outer Zone Granitic Rocks in Kii peninsula and Kyusyu island range 15.5 to 14.0 Ma, 15.1 to 12.4 Ma and 15.6 to 13.4 Ma. Thusly, along arc variation of the age of the near trench

igneous rocks is not observed. (2) The oldest age samples of Outer Zone Granitic Rocks were usually obtained from the igneous bodies in the closest area to the trench, and weak across arc trend of the age variation is found in Outer Zone Granitic Rocks. (3) Comparing to the recent discussion on the completion period of the clockwise rotation of SW Japan arc (Hoshi et al., 2015; Sawada et al., 2013), all the magmatism occurred after the rotation. (4) Since the ages of the alkaline basaltic rocks with OIB-like trace element signatures also range 15.2 to 11.7 Ma, i.e. after the rotation, these magmas should have been supplied from the mantle beneath the subducting Philippine Sea Plate.