[EE] Evening Poster | S (Solid Earth Sciences) | S-MP Mineralogy & Petrology

[S-MP35]Antarctica and surrounds in Supercontinent Evolution

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Supercontinent formation and dispersion has been enigmatic in the Earth's history. Eurasia is one such current supercontinent and incredible progress in the understanding of its geological evolution has been achieved in the past decade. Earlier supercontinents in the Earth's history such as Gondwana (0.5 Ga), Rodinia (1.0 Ga), Columbia/Nuna (2.0 Ga), Kenorland (2.5 Ga) and Vaalbara (3.1 Ga), have been the focus of several studies, however limited information on older supercontinents has restricted an understanding of their tectonic evolution. Antarctica and surrounding areas in Gondwana, including southern Africa, Sri Lanka, India, Australia, are key regions for studying several important unsolved issues. In honor of the retirement of Professor Kazuyuki Shiraishi, Director of the National Institute of Polar Research, who developed the pioneering geological and geochronological framework of Antarctica within the Gondwana supercontinent, we invite authors around the world to present new as well as review results on the continental scale crustal processes and tectonic evolution that are associated with supercontinent formation events in Earth's history. The well-studied Eurasia, Pangaea, Rodinia and Gondwana supercontinents are of particular focus. Topics of interest include, but not restricted to, extremes in metamorphism, P-T-d-t evolution, magmatism, and the role of fluids. We hope to provide a platform for scientific discussions that will enlighten our understanding of the physical and chemical processes in the continental crust that records episodes of orogenesis that contributed to the formation and evolution of supercontinents.

[SMP35-P03]U–Pb zircon geochronology on high-grade metamorphic rocks from the Higo metamorphic Belt in central Kyushu, Japan

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The Higo metamorphic Belt in west-central Kyushu, southwest Japan is an imbricated crustal section in which a sequence of metamorphic rocks with increasing metamorphic grade from northern (greenschist-facies) to southern part (granulite-facies) is exposed (Osanai et al., 1998). Five metamorphic zones have been defined by mineral assemblages of metapelites in this belt: zone A by Chl+Ms, zone B by Bt+Ms+And, zone C by Kfs+Sil+Bt, zone D by Grt+Crd+Bt, zone E by Opx (Obata et al., 1994). Additionally, Osanai et al. (2006) proposed the new zone as zone F on the basis of the presence of Spr granulite. This study reports the U-Pb zircon geochronological characteristics of high-grade rocks in the Higo metamorphic Belt to access the metamorphic conditions as well as tectonic correlations to other terranes in Japan. Most of pelitic gneisses and associated granitoids in this study were collected from zone D. The metapelite are mainly composed of plagioclase, quartz, biotite, garnet, cordierite, and accessory amount of sillimanite, spinel, zircon, monazite, apatite, graphite and opaque mineral. The mineral assemblage under the peak metamorphism is represented by

garnet+cordierite+biotite+plagioclase+quartz. The garnet porphyroblasts show the resorption texture that replaced by secondary biotite and/or cordierite. Cordierite also occurs as anhedral porphyroblasts with or without inclusions of biotite, plagioclase, spinel, sillimanite, quartz, apatite. Sillimanite is included in cordierite, garnet and quartz. Dark-green spinel is subhedral in shape and occurs only as inclusions associated with sillimanite in cordierite porphyroblast. The distribution and textural features of late-forming biotite, cordierite and prehnite indicate that these pelitic gneisses are highly affected by later hydration.
Zircons exhibit internal structures of bright oscillatory or sector zoning cores with dark faint to unzoned rims, and dark faint or patchy zoned cores with bright homogenous rims. U-Pb zircon dating by laser ablation-inductively coupled plasma-mass spectrometry provided *ca.* 105-125 Ma with low Th/U ratios from overgrowth rims and other older age dates of 182-284, 350-450, 900-1000, 1800 and 2000 Ma with various Th/U ratios from the relic cores. The internal textures and Th/U ratios indicates the former as the metamorphic ages and the latter as detrital ages. The associated igneous rocks cutting the foliation yielded the zircon U-Pb ages of *ca.* 105-110 Ma. It suggests these igneous rocks intruded into host metamorphic rocks after peak metamorphism at *ca.* 105-110 Ma. The maximum depositional age of protolith sediments was deduced at *ca*. 150 Ma on the basis of the youngest detrital zircon date. The detrital age distributions possibly indicated that the zircon provenance for Higo metamorphic rocks might be derived from the North China craton (Suga et al., 2017) or South China craton (Isozaki et al., 2010; Fujisaki et al., 2014). The similarities, including the Cretaceous age high-temperature with low to medium pressure metamorphism and the presence of the Proterozoic to Triassic provenance of sediments from zircon dates, suppose that the Higo metamorphic Belt may correlate with Ryoke Belt further to the east (Dunkley et al., 2008; Herzig et al., 1998) as well as the Abukuma Belt to the north (Dunkley et al., 2008; Hiroi et al., 1998) and South Kitakami Belt (Dunkley et al., 2008; Sakashima et al., 2003). In addition, the detrital zircon ages of 235-250, 282, 350-450 and 1844 Ma are consistent with those from psammitic schists in the Sangun Belt (Chizu belt, Suga et al., 2017; Suo belt, Tsutsumi et al., 2003), suggesting that the protolith of the Higo high-T metamorphic rocks is possibly equivalent to that of the Sangun high-P metamorphic rocks.