Across-arc variations of felsic and basaltic volcanisms in the southren Izu arc, Japan

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The southern Izu arc between the Aogashima and the Torishima Islands is characterized by basaltic islands and submarine felsic calderas associated with bimodal volcanisms. Intra-arc rifting between the volcanic front and the rear-arc knolls is also active in this region. Volcanic rocks were obtained from the rift zone by dredging during a research cruise of the R/V MOANA WAVE (Hawaii University, cruise MW9507) in 1995. These volcanics also show bimodal characteristics. Geochemical studied on the basalts and their magma genesis has been made (e.g. [1]). We here present the results of petrographical and geochemical analyses of the felsic rocks. We also compare them with the basalts and examine magma genesis of the felsic rocks in the rift zone. The results show that the intra-rac rift basalts show significant across-arc variation ranging from depleted volcanic front side to enriched rear-arc side. The origin of this variation is considered to be both different degree of mantle depletion and different degree of slab fluid contribution. Felsic lavas are mostly rhyolite and show a similar across-arc variations with that of basalts in the geochemical indicators of slab fluid flux such as Ba/Zr and Th/Zr. In contrast, the indicators of source depletion, such as Nb/Zr and La/Yb, show a different feature. The difference is shown by a compositional gap found between the volcanic front and the rear-arc rhyolites with a peak value occurring at ~50 km away from the volcanic front. Felsic magmas in the Izu arc was considered to have generated from partial melting of the middle to lower crust (e.g. [2]) We examine the origin of these geoghemical characteristics of rhyolites in association with the growth of the arc crust in this presentation.

[1] Hochstaedter et al. (2001) *Geochem. Geophys. Geosyst.* **2**: 1019, doi: 10.1029/2000GC000105
[2] Tamura and Tatsumi (2002) *J. Petrol.* **43**: 1029-1047