Evolution of the N-Izu rear arc magma source as revealed by the site U1437 of IODP Exp. 350

T. MIYAZAKI[1]*, T. SATO[1], Y. TAMURA[1], C. HAMELIN[2], J.B. GILL[3], S.M. DEBARI[4], J.-I. KIMURA[1], B.S. VAGLAROV[1], Q. CHANG[1], R. SENDA[5], S. HARAGUCHI[1]

[1]JAMSTEC, Yokosuka, Japan
(*correspondence: tmiyazaki@jamstec.go.jp)
[2]University of Bergen, Norway
[3]University of California Santa Cruz, USA
[4]Western Washington University, USA
[5]Kyushu University, Fukuoka, Japan

IODP Site U1437 is located in the Izu rear-arc region, at 31.790 N, 139.026 E. The recovered core consists of seven lithologic units (Unit I–Unit VII). Four of the units are from below 1000 mbsf (Unit IV to Unit VII). These four units include volcaniclastics and hyaloclastites with coarse lava clasts as well as tuff and lapilli-tuff, and have ages about 6–14 Ma [1, 2]. The geochemical characteristics of Unit VII volcaniclastics are expected to reflect the mantle source of early N-Izu-rear arc magmatism soon after Shikoku BAB opened between 24–15 Ma.

Major and trace elements of the Unit VII lava clasts differ from those of the Neogene rear-arc seamounts or Quaternary arc-front volcanoes. The trace element characteristics indicate weak influences from the slab. Sr-Nd-Pb-Hf isotope data of the Unit VII lava clasts show a very narrow variation range, indicating the existence of a common magma souce throughout Unit VII activity. On the contrary, upper units (especially Unit IV and Unit V) show a wider range of isotopic variation, reflecting the increased influence of slab material. The most striking feature is the co-existence of two types of magma: one type is similar to Unit VII, while the other is resembling the rear arc seamount chains.

We modelled the early N-Izu rear-arc magmatism using the Arc Basalt Simulator v. 4 (ABS4), coded by [3]. The calculation reveals that the depth of origin of the slab component was deeper, and the percent of slab component and mantle melting both were smaller, compared to the modern volcanic front. Many parameters are mostly similar to those responsible for current rift type magmatism.

We confirm that the earliest stage rear-arc volcanism after back-arc basin opening had weak and deep slab contributions, and that the slab contribution increased with time.

[1] Tamura *et al*. (2015) *Proc. IODP, Exp.* **350**. [2] Schmitt *et al*. (2018) *Int. Geol. Rev.* **60**, 956-976. [3] Kimura *et al*. (2014) *Geochem. Geophys. Geosyst.* **15**, 691-739.