

Geochemical & geochronological constraints on the subduction initiation of the Izu-Bonin arc

O. ISHIZUKA^{12*}, K. TANI³, Y. HARIGANE¹, Y.
OHARA⁴, R.N. TAYLOR⁵, Y. KUSANO¹, R.
HICKEY-VARGAS⁶, G. M. YOGODZINSKI⁷, M.
SUDO⁸, A. MCCARTHY⁹, I.P. SAVOV¹⁰, R.J.
ARCULUS¹¹, K. BOGUS¹²

¹ Geological Survey of Japan/AIST,

*correspondence: o-ishizuka@aist.go.jp

²JAMSTEC, Japan

³National Museum of Nature and Science, Japan

⁴Hydrographic and Oceanographic Department of
Japan

⁵University of Southampton

⁶Florida International University

⁷University of South Carolina

⁸Universitaet Potsdam

⁹University of Lausanne

¹⁰University of Leeds

¹¹Australia National University

¹²Texas A&M University

Recent geological surveys including IODP expeditions in the Philippine Sea are providing new geochronological and geochemical constraints to tectonic reconstruction of the Philippine Sea Plate for the period immediately before and after the subduction initiation (SI) to form Izu-Bonin-Mariana (IBM) arc. 1) OIB-like magmatism in the Philippine Sea forms time-progressive volcanic chain mirrored either side of the West Philippine Basin (WPB) backarc spreading center [1]. This implies that the Mesozoic arc terrane of Daito Ridge Group were split by regional upwelling centered on the impact of the mantle plume at close timing to SI of the IBM arc. 2) New geochronological and magnetic anomaly data seem to indicate that ocean basins occupying southern part of the Philippine Sea, i.e., WPB and Palau Basin, formed contemporaneously. This means that these basins formed after SI of the IBM arc. 3) IODP Exp.351 recovered basaltic basement of Amami Sankaku Basin, i.e., pre-IBM arc oceanic crust [2]. This basement is strongly depleted in highly immobile elements and has strong similarity to forearc basalt (FAB) at SI, but distinct from many Philippine Sea basin basalts. Biostratigraphy of sediment above basement determined that the basement is contemporaneous, or slightly older than FAB, and Ar/Ar dating of basement basalt is under way. We will discuss possible tectonic reconstructions for the period of SI.

REFERENCES:[1] Ishizuka, Taylor, Ohara & Yuasa (2013), *Geology* 41, 1011-1014. [2]Arculus, Ishizuka, Bogus et al. (2015), *Nature Geoscience* 8, 728-733.