Zircon U-Pb geochronology of the Izu Peninsular and Northern Izu-Bonin arc basement rocks

Kenichiro Tani[1]; Daniel Joseph Dunkley[2]; Osamu Ishizuka[3]; Ichiyo Isobe[4]

[1] IFREE, JAMSTEC; [2] NIPR; [3] GSJ/AIST; [4] Geological Survey of Japan, AIST

Precise age determination of volcaniclastics that compose the basement rocks of the Izu-Bonin arc is important in understanding the temporal evolution of the upper crust in Izu-Bonin arc and the development of Quaternary Izu-Bonin volcanoes. Although it has been widely assumed that the basement rocks of Quaternary Izu-Bonin volcanoes are of a similar facies to the Miocene Yugashima Group, exposed widely in the southern Izu Peninsular, there has been no strong geochronologic evidence to support such a correlation, since both these basement rocks and the Yugashima Group have experienced hydrothermal alteration.

Taking the advantage of the robust characteristics of zircon U-Pb geochronology, we have successfully obtained high-precision ages from altered volcaniclastics of the Yugashima Group and altered andesitic - dacitic lava samples from Kozushima and Niijima. The results show that basement rocks of Kozushima and Niijima are significantly younger (~1 Ma) than the volcaniclastics of the Yugashima Group (~7.5 Ma), which implies that Quaternary Izu-Bonin volcanoes are built upon a Quaternary basement, rather than Miocene basement.