

Synchronism of volcanic activity and graben formation at Unzen volcano revealed by the Unzen Scientific Drilling Project USDP-1

Kozo Uto[1], Hideo Hoshizumi[1], Akikazu Matsumoto[2]

[1] AIST, [2] Deep Geol. Center, AIST

<http://www.gsj.go.jp/~uto/>

Synchronic activities of volcanism and graben formation have been revealed by the 750m-deep scientific at the northeastern flank of Unzen volcano. Pyroclastic and lahar deposits between -104m to -601m are revealed to have deposited within a few tens of thousand years at around 200 ka. These deposits have been accumulated immediately inside the northern boundary of the regional Unzen graben system, which has been active during the intensive volcanism at 200 ka.

Unzen volcano is located in the back-arc side behind the volcanic front of Ryukyu arc, and inside the tectonic graben running E-W named Beppu-Shimabara graben system. We have conducted a scientific drilling (USDP-1) at the northeastern flank of the Unzen volcano in order to know the evolutionary history of Unzen volcano, whose early volcanic products are mostly buried beneath the recent products. The drilling site is just inside the northern boundary of the regional graben. The basement of Unzen volcano, 0.5 Ma pyroxene andesite, appeared about 700m beneath the surface. Among the 700m-thick deposits of Unzen products, pyroclastics and lahar deposits between -104m to -601m gave K-Ar ages of about 200 ka. Considering the analytical uncertainties of age analyses, these 500m-thick deposits were accumulated within a few tens of thousand years. As these deposits are those deposited in topographically low areas, the drilling site are considered to have rapidly sunk while vigorous volcanic products reached the area. Chizawa fault, the northern boundary of Unzen graben cut and displaced the northwestern slope of Unzen volcano. As lavas consisting the northwestern flank gave K-Ar ages between 300-380 ka, the Chizawa fault should have moved rapidly after 300 ka, which is consistent with the analyses of the drilling cores from the northeastern flank. Unzen volcano made rapid growth at about 200 ka contemporaneously with the active regional graben formation.