

## Structure of Unzen volcano inferred from seismic reflection survey

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Unzen volcano locates at western tip of the Central Kyushu Rift Valley, Kyushu district, Japan, which erupted repeatedly every about 200 years. We carried out seismic reflection survey to get knowledge about a mechanism of the eruption during 1990-1995. The survey line is about 12km long passing through 2km west from the lava dome of last eruption. Observed data are processed by techniques used in ordinary reflection survey.

We found several features in the depth section after migration. 1) Reflectors in reflective region to the depth of about 3000m vanish at two zones. One locates just below lava dome of Unzen volcano. Its extent is in the depth range from 0 to 2500m. It is seems that a dike intrudes reflective layer toward the lava dome. Another is at north of about 3000m from the lava dome. The portion beneath the lava dome indicates a relation to the conduit in last eruption about 10 years ago as one possible interpretation. 2) Many faults with higher dip angle than 60 degree are identified just beneath the profile. Most of these faults are classified in normal fault type. These normal faults explain that this area forms graben structure under tensional stress field as suggested by geological study. Largest active fault in this area named Chijiwa fault is noticeable in the seismic section as reflector gap in wide depth range. Lower limit in depth of reflective layer becomes shallower with increasing distance from lava dome. This is also a factor specified graben structure. 3) Strong reflectors at about the depth of 3km can be seen in the north of the lava dome. The reflectors have horizontal extent. Ishihara (1993) estimated locations of the pressure source activated on the last eruption from geodetic data under point source assumption. According to their result, one of the sources is located just beneath these reflectors. It is considered that the estimated pressure sources imply the center of magma chamber expanding on the last eruption.

From consideration of visibility on a seismic section based on Fresnel zone size, we estimated width of the conduit inferred from non-reflecting zone on the depth section. The width of conduit in the depth range of 0-2500m below sea level is estimated as the zone sandwiched in between solid and dashed lines in Fig.5. Those are within several hundreds meters to 1km width. Size of estimated conduit is so large comparing with conduit size at the surface of about 20m. Moreover, from geodetic data, there is no evidence supporting intrusion of magma with such a large size. Non-reflecting zone only implies homogeneous media in seismic reflection survey. Therefore, it is considered that the conduit detected in this study reflects a set of plural conduits contributing to past eruptions as well as last eruption.