

Concentration of pressure at the uppermost part of the conduit before explosive eruptions at Showa crater, Sakurajima volcano

Masato Iguchi[1]; Akihiko Yokoo[2]; Takeshi Tameguri[3]

[1] SVO; [2] SVRC, DPRI, Kyoto Univ.; [3] SVRC,DPRI,Kyoto Univ.

Characteristic strain changes were detected by extensometers in underground tunnel 2.1 km from the Showa crater of Sakurajima volcano, before occurrence of explosive eruptions at the crater in February 2008 and February 2009. Tangential component of the extensometer showed extension of 13 nano strain 1.5 h before an explosion at 11h25m (JST=9h+UT) on February 6, 2008. In contrast, Radial component showed contraction of 25 nano strain. The depth of a Mogi's source causing the strain is estimated to be 350 m beneath the Showa crater. The Mogi's source at the depth causes tilt change of only nano radian order, and no remarkable tilt change was not detected actually. Explosive eruptions in February 2009 had the similar characteristics ground deformation. Depths of the Mogi's source ranged from 0 to 800 m. It is inferred that internal pressure was concentrated at the uppermost part of the conduit before occurrence of the explosions at the Showa crater.

Ground deformation before explosive eruptions at Minamidake crater, which have been active since 1955, has different patterns. Both radial and tangential strains indicated extension and tilt showed remarkable tilt of the crater-side-up. Depths of Mogi's source causing the ground deformation ranged from 2 to 6 km. The pressure source in the pre-eruptive stage of the Showa crater is significantly shallower than that of Minamidake crater.