

Magma accumulation process at Izu-Oshima volcano by using high-density GPS observation network

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We carried out the high-density GPS-repeated observation in Izu-Oshima volcano for the period from November 1998 to September 2003, and the detailed displacement pattern was revealed clearly.

In order to explain this three-dimensional pattern obtained, several pressure sources are estimated by the grid-search method used FEM with topography in Izu-Oshima volcano. Consequently, three sources, an inflation sphere of 7km in depth, a spreading crack of 2km and a deflation sphere of 0km, are evaluated.

The position of these pressure sources changes from the position calculated without topography. The inflation sphere shifts 1000m shallower and 600m southwestward, and the deflation sphere does 250m shallower.

The rate of volume change by these pressure values of major sphere, crack and minor sphere source is 1.5, 1.1 and $-0.0022 \times 10^6 \text{[m}^3/\text{Year]}$ per year, respectively.

The model of the magma supply system of the process of eruption preparation is proposed as follows. The spherical main chamber is supplied magma $2.6 \times 10^6 \text{[m}^3/\text{Year]}$ per year constantly, and magma of $1.1 \times 10^6 \text{[m}^3/\text{Year]}$ among the whole is moreover supplied a shallower chamber of a crack shape of 2000m in depth. In the 1986 summit eruption, the conduit of vent plugged from the deeper main chamber into summit via the shallower sub chamber. The shallower deflation source beneath the summit means the possibility that this secondary shallower chamber as buffer of the summit eruption has deflated since 1986 continuously.

In this way, even in the volcano which is in the process of the eruption preparation as like Izu-Oshima volcano, it will be possible of mid- and long-term prevision of volcanism by the observation of the detailed pattern of crustal deformation. For the sake of this, it is necessary of the improvement in the accuracy of time, as like the total continuous measurement.