

## **Magma reservoir-vent system within Miyake-jima volcano revealed by GPS observations of crustal deformation associated with the emission of volcanic gas**

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Analysis of GPS data during the degassing stage of volcanic activity at Miyake-jima volcano, Japan, in 2000 indicates a source of crustal deformation on the south side of the summit crater wall at a depth of 5.2 km. The rate of volume fluctuation was  $-3.8 \times 10^5 \text{m}^3/\text{month}$  from September 2000 to January 2001 and  $-0.8 \times 10^5 \text{m}^3/\text{month}$  from February to June 2001. As the volume is equivalent to the volume occupied by the volatile components dissolved in the magma, it is proposed that contraction of the magma reservoir reflects degassing of its volatile components. The observations indicate that the magma reservoir is connected to the summit crater by a magma-filled vent. Convection within the vent carries volatile-rich magma upward to the crater, where volcanic gas is released by degassing. The depleted magma is then carried into the magma reservoir, which contracts due to the loss of volume originally occupied by the volcanic gas.