

## Magma supplying system beneath Miyakejima volcano: sill-like magma reservoir opening inferred from tilt steps

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The Miyakejima volcano activity, which started on June, 26th, 2000, is characterized by four stages, i.e., the 1st stage: dike intrusion(2000/6/26 18:00-6/27 12:00), the 2nd stage: the shrinkage of volcanic body(6/27 12:00-7/7), the 3rd stage: summit crater collapses and tilt-steps (7/8-8/18) and the 4th stage: the shrinkage of volcanic body and summit eruptions (8/18-). The activity, whose main topic is volcanic gas emission, is still continuing in Feb. 2001. Through the activity, NIED (National research Institute for Earth science and Disaster prevention)Miyakejima volcano observation network have detected many volcanic phenomena and we focus on the tilt-steps in the 3rd stage to grasp the magma supplying system beneath Miyakejima volcano.

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Tilt-steps and 50s pulse waves have the following features; (1) the magnitudes of tilt- steps are larger in northern part (MKE, MKS, MKK) than the other part, (2) the magnitudes of tilt-steps at MKA are small, (3) the sense of tilt-steps at MKT is down to ENE, (4) very long time duration of pulse wave as long as 50 s, (5) the pulse waves have no oscillation component, (6) the 50 s pulse waves were observed at the stations as far as 1,000 kilometers, (7) wave packet with 0.7 Hz frequency appeared at the end of 50 s pulse waves, (8) the increase of low frequency earthquakes preceded the tilt-steps and tilt changes suggested the expansion of volcanic body from one-hour before the tilt-steps, (9) the 46 tilt-steps are classified to three groups: 7/9 - 7/19, 7/20-7/28 and 7/29 - 8/18.

We assume the source of tilt-steps and 50 s pulse waves to be an opening of a tensile crack, and obtained the best-fit model. The result suggests that the source is a sill-like area with the length of 8-20 km, the width of 1-4km, the depth of 7-8km, the inclination of 20 degrees (upward to the summit), the direction of normal vector of S30W, and the opening of 10-50 cm. The volume change for each step is estimated about  $0.1 - 1.1 \times 10^7 \text{m}^3$ .