

On temporal variation of SP spatial distribution on Miyakejima Island before and after the 2000 summit eruption

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We performed repeated SP surveys on Miyakejima volcanic island in the Izu-Bonin arc, before and after the 2000 summit eruption. Before the eruption, stable W-shape anomaly was detected in 1991, 1995, 1996 (Sasai et al., 1997) and the stability was also confirmed by long baseline electrical potential difference monitoring from 1997 to 2000 (Sasai et al., 2002). In Sasai et al. (1997), the W-shape anomaly was interpreted as Λ - shape anomaly due to up-going geothermal fluids near the summit, in addition to the V - shape anomaly due to down-going underground water via the electrokinetic phenomenon. On the other hand, Ishido (2004) pointed out necessity of considering existence of highly conductive portion in the volcanic body to explain the W-shape anomaly.

After the eruption, we performed repeated SP surveys in the island, on the southern survey line (from the southern coast to the summit) in 2001, and not only on the south line but also on the northern line (from the northern coast to the summit) in 2005 and 2011, and on the central ring road which connects the south and north lines in 2012.

By the long baseline observation, we detected enhancement of the electrical potential at SSW flank of the summit near the central ring road compared with that at a point near the SSE coast, by about 150mV coincident with the intense summit eruption on 18, Aug., 2000. This enhancement was confirmed by the subsequent SP survey in 2001: at altitudes from 300 to 600m, where minimal potential of -600 to -500 mV compared with the potential near the coast had been detected in the 1990-s surveys, the electrical potential was enhanced in comparison with that by the 1990-s surveys. We interpreted that this enhancement was related to intense volcanic gas emission from the southern edge of the central caldera, which was generated on 8 Jul., 2000.

However, the temporal variation of the spatial distribution of SP of the same trend was still detected in 2005 compared with the results in 2001, and still in 2011 compared with the results in 2005, although

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surface activities of the volcano is now getting the calmer. The potential enhancement probably indicates large-scale temporal variation of hydrothermal activity or that of subsurface electrical conductivity structure.