Magnetic structure of Sakurajima volcano determined from high-resolution aeromagnetic survey.

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In November, 2005, we conducted helicopter-borne aeromagnetic surveys at about 250m above the terrain over Sakurajima Volcano, Kyushu, Japan. We applied the apparent magnetization intensity mapping method to the newly obtained aeromagnetic data assuming that the magnetization intensity varies only laterally. Results showed following features: (1) Apparent magnetization highs predominate on the eastern region of Sakurajima, where thicker lava flows occupied, compared with the western region of Sakurajima. (2) Apparent magnetization intensities of lava flows were from 4.0 to 7.0 A/m. The most remarkable highs of 6.0 A/m were located on the lava around An'ei craters and on the northeastern flank of Kita-Dake summit. (3) Magnetization lows of 1.0 A/m are locally distributed around the Showa crater, suggesting a high temperature in the shallow part. In addition, magnetization lows of 3.0 A/m lie over the northern slope and over the northwestern area of Kita-Dake which are likely to reflect debris flow deposits and volcanic fans. To examine the validity of the obtained map, we carried out rock-magnetic studies. The total magnetization intensities for the surface-rocks showed reasonable correlation with the mapped values.