3D-magnetic tomography of Izu-Oshima volcano as inferred from airborne magnetic anomalies

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A magnetic inversion algorism is developed for constructing a 3D-tomography of the volcanic edifice. This method consists of two steps, in the first step, an uniform magnetization model throughout the body is assumed for calculating a mean magnetization intensity and residual fields, by subtracting the calculated anomalies from observed ones. In the second steps, the magnetization deviations from the mean value are calculated for each prismatic block constituting the three dimensional body by the refined Conjugate Gradient iteration method. The above algorism was applied to the airborne magnetic anomalies of Osima volcano surveyed in 1987 and in 2003. The derived 3D-magnetic structures show the following characteristics, 1)the nearly NW-SE trending magnetic basement high at the base part of the volcano, 2)the relatively weak magnetization zones beneath the northeastern coastal zone and its offshore area, as well as 3) the relatively weak magnetization zones beneath the southwestern flank of the edifice. These characteristic features of the magnetic structure may be related with the constructing process of Osima volcano as well as inner thermal state relating with magma supply system.