論　説

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諏訪之瀬島の火山体浅部3次元P波速度構造と爆発発生場

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Three-dimensional P-Wave Velocity Structure and the Explosion Field at the Shallow Part of Suwanosejima Volcano

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Three-dimensional P-wave velocity model beneath Suwanosejima Volcano, southwest Japan, was determined by inversion of 764 rays from 9 artificial shots recorded on 97 seismic stations. We constructed 35,505 grid models in order to perform the inversion with the possible grid spaces. As a result of all inversions, the calculations of the 29,918 grid models converged. We also averaged the P-wave velocities calculated with the selected 300 models with AIC (Akaike's Information Criteria) smallness from all the resolved models to obtain the final P-wave velocity model does not depend on the grid configurations.

The final P-wave velocity model is well resolved from the surface to about 0.3 km below sea level. A region with high P-wave velocity up to 4.3 km/s exists below sea level at 1 km west of the collapse caldera, which may represent silicic intrusive rocks. Besides, another high P-wave velocity, mountain-like, body that gradually extends from sea level to the vicinity of the active crater of the volcano is revealed. The peak of the body, however, shifts southeastward about 0.5 km from the active crater. We, therefore, suppose that the high velocity body is a result of the accumulation of the dense volcanic blocks and/or agglutinates in the vicinity of past eruptive vents through the growth process of the volcano edifice. On the other hand, very-long period pulses lasting before and after explosive eruptions and the explosion earthquakes occur at the inside of the high P-wave velocity, 3.0–3.8 km/s, area beneath the crater. It is, therefore, concluded that the explosion field of Suwanosejima Volcano is located in the high P-wave velocity area.

Key words: Suwanosejima volcano, three-dimensional P-wave velocity model, inversion, explosive eruption, explosion earthquake

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