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Subsurface structure of Fuji volcano, inferred from the seismic experiment.

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Pseudo-Reflection seismic profiling and seismic reflection structure of Fuji Volcano is discussed.

Fuji Volcano is a quatanary volcano and locates at 35 21'N, 138 44'E. Fuji Volcano is the highest (3776m A. S. L.) and the most beautiful mountain in Japan.

Fuji Volcano is still active. Repititive historical eruptions were recorded since 781 AD up to December 1707, the last frank eruption. Although any eruptions were reported since 1707, underground activities, such as the low frequency earthquakes (e. g. kanjo et al., 1984; Ukawa and Ohtake, 1984), are still going. Moreover, enhancement of deep low-frequency tremor was reported by Ukawa(2001). Nakamichi et al.(2005) reports concentrated hypocenters of the low-frequency event at 15km beneath the volcano.

Although, Fuji Volcano is attractive object for earth scientists, detailed and actual structure is still under the vail. Steep topography, the isolated summit, and its altitude prevent us from precise study of its structure.

A seismic experiment with chemical explosions were carried on 2003, as a part of the national project, entitled seventh Prediction of Volcanic Eruptions. The purpose of the experiment was getting constraints to seismic structure of Fuji volcano. Oikawa et al. (2004) reported upper crust structure of Fuji Volcano down to 15km from first and later phase arrival time analysis.

On the other hand, a new method, Pseudo-reflection profiling was applied to the same data. The method extracts multiple reflections with autocorrelation of a surface seismogram and constructs an equivalent of zero-offset reflection seismogram. Only surface seismogram is required for a pseudo-reflection seismogram because processing includes the equivalent plane wave incident. In the conventional method, a zero-offset reflection seismogram is obtained through CMP stack after NMO correction in CMP gather. the conventional method requires a close shot-receiver geometry at data acquisition. Pseudo-reflection profiling method provides an advantage in steep topographic sites like Fuji volcano because of its separation between source and receiver.

Waveforms were inspected to have clear onset or later arrivals and were used for the Pseudo-reflection method. Inspection about incident angle was also applied.

Pseudo-Reflection profiles from Southwestern foot to Eastern foot through the summit and through the north frank are obtained. Three significant horizons, the horizons OF/PK, M, K, are observed in these profiles. The horizon OF/PK distributes beneath north frank and dips northwestward. The horizon M appears beneath Fuji Volcano and dips westward. The horizon K distributes beneath the central part of Fuji Volcano and dips southward. It appears at 0.7s at the summit and declines down to 1.3s in two way time. The horizon K may extend up to 2700m a. s. l. at the northern frank.

The reflection profile is interpreted in the basis of deep drilling core analysis at the northern frank. The horizon OF/PK is correlated to the upper boundary of Paleo-Komitake (Yoshimoto et al., 2004) with the drill hole ERI-FJ3 at the end of the line. The horizon M is considered to be the top of Misaka group, as a basement of Fuji volcano because tertially outcrops appear to the extention of the horizon and the deep drilling at the southern frank. The horizon K is correlated with the upper face of Ko-fuji volcano deposits.

This result suggests important informations about Ko-fuji volcano that its summit may locate beneath northern frank of Fuji volcano and its topography can be similar as that of Hokkaido-komagatake volcano. Another significant speculation is also provided that the summit of Paleo-komitake volcano can be east of present Fuji volcano.