

# The seismic stratigraphic features of chain volcanoes around the Miyakejima and Hachijojima Isls, Izu frontal arc, Japan.

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Formation of summit caldera and northwestward migration of hypocentre of the earthquakes during the volcanic event of the Miyakejima Isl. in 2000 imply the northwestward injection of magma from beneath the Miyakejima Volcano (e.g. Geshi et al., 2002; Toda et al., 2002). Occurrence of swarm of earthquakes beneath the Hachijojima Isl. accompanied by the long-period signals also implies the transport of the magma northwestward from the Hachijo-Nishiyama Volcano, northern part of Hachijojima Isl., (Kumagai et al., 2002). To obtain direct evidence of the magma transport in the relatively long distance (approximately 40km), we conducted to survey the area around Miyakejima, Ohnoharajima and Mikurajima Isls, and the area northern Hachijojima Isl. at KR04-01 cruise (R/V Kairei). We obtained single channel air-gun (G.I. gun) profiles, as well as dredged rocks and SEABEAM maps. We here introduce the volcanostratigraphic features and their tecto-stratigraphic background, according to the seismic profiles.

In the area around Miyakejima, Ohnoharajima and Mikurajima Isls, north of the Mikura Basin, many horsts and (half) grabens are distributed. Their trends are generally NNE-SSW and NNW-SSE. Horst widths are narrow (0.5-5 km). Though high-amplitude reflectors on the sea bottom widely mask the strata under the sea bottom, the grabens are filled with the high-amplitude and moderately-continuous reflectors (max. 0.7 sec). These features imply highly-tensional tectonics and coarse-grained volcanoclastic sedimentation.

The volcanoes in this area are chainly arranged. The biggest chain extends about 40 km from the west of the Miyakejima Isl, bounded from the eastern margin of the Mikura basin. Though the biggest chain volcanoes are located at the margin of the Mikura basin, most of volcanoes are located at the thickest part of graben. Each volcano is generally 100-200 m high and has less than 3 km basal diameter. Though volcanoes are similar to horst in their widths, the volcanoes are mainly composed of high-amplitude less-continuous reflectors. The base reflectors of their chain-arranged volcanoes are traceable as the same reflector. They are suggested to develop at the same time in the profile resolution (30m).

The area northern Hachijojima Isl. is thickly-deposited (more than 1.2 sec) sedimentary basin. The basin is gently subsided in NNW-SSE oriented axis. The strata of this basin are composed of even, well-continuous moderately-amplitude reeflectors, indicating continuous, relatively fine-grained sedimentation. The reflectors are divided at least three stratigraphic units by unconformities, related to the basin subsidence.

A volcanic chain extends about 15 km from the Hachijo-Nishiyama Volcano in NNW direction. The sizes of the volcanoes are generally 100-150 m high and about 2 km in basal diameter. They sometimes form volcanic ridges rather than independent cone. These volcanic ridges are located at the most subsided zone of this basin. Seismic profiles reveal all volcanoes are well-stratified and the oldest downlap reflectors of volcano apron refer to the same reflector, namely the base reflector of the upper unit (less than 0.1 sec). Close investigation of reflectors (wave to wave) demonstrated the apron reflectors of these volcanoes interfinger each other.

Concludingly, these volcanic eruptions can be related to the basin subsidence and mostly occurred at almost same time in the profile resolution. These indicate tectonic control on the location and timing of the volcanism. Reflectors of volcanoes are different between those in the area around Miyakejima Isls and the area northern Hachijojima Isl. They may be imply volcanoes' petrography, which will be discussed.