Volcanic Geology of eruption of Mukaiyama Volcano in A.D.866, Niijima. -regarding deposit of pyroclastic density current-

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Niijima is one of the Quaternary volcanic island belonging to the Seven Izu islands, and is located at about 160 km southwest of Tokyo. The island is made up of thirteen monogenetic rhyolitic volcanoes and one basaltic volcano. Recently, the end of June 2000, the island and adjacent volcanic islands (Shikinejima and Kouzusima) became active in seismicity accompanied by the volcanic eruption of Miyakejima volcano, about 30 km southeast of Niijima. So, study on the last activity of Niijima is important for mitigation of volcanic hazard.

Mukaiyama volcano, one of monogenetic volcano in southern part of Niijima, erupted in A.D.866. The eruption can be divided into four stages, from start to end; 1st stage (abbreviation of the deposit: My1), 2nd stage (My2), 3rd stage (My3) and 4th stage (My4). My1 is stratified deposits due to pyroclastic density currents, My2 is well sorted pyroclastics deposits due to pyroclastic fall, My3 is lava domes, My4 is thin pyroclastic deposits due to small-scale pyroclastic density currents or pyroclastic fall on the lava dome.

On previous studies, there are two opinions that the deposit at Mamashitaura is formed by eruption of Mukaiyama eruption in A.D.886 and it is formed by pre-eruption of Mukaiyama eruption in A.D.886.

In this study, paying attention to mud layers and glassy grains in deposits at Mamashitaura, I analyzed mud minerals consiting of mud layers and measured hydrated layer of glassy grain.

There are many studies that discuss relation of physical parameters of pyroclastic densty current and depositional structure formed by it. Cas and Wright (1987) assert that pyroclastic density current divide into pyroclastic flow and pyroclastic surge by flow dnsity, and the farmer's deposit is characterized by massive structure, the latter's deposit is characterized by layered structure, that is to say, that flow density is related deposit structure. Shon, Y.K. et al. (1989) describes that the structure of pyroclastic deposits in the Suwolbong tuff ring change from poorly-sorted and massive structure to thinly stratified structure, as go away from vent. And, they assert that that structure variation was caused by depositonal rate and particle concentration of pyroclastic density currents. Dellino, P. et al. (2004) estimates velocity and dynamic pressure of base surge at Campi Flegrei, using idea of fluid dynamics.

At sedimentology, there are many studies that estimate velocity of turbidite and paleotidal current analyzing depositional structure.

In this study, regarding My1 of Mukaiyama eruption in A.D.886, I describe variation of depositional structure in detail, as preliminary step toward estimating physical value of pyroclastic density current.