

Propagation of weak pressure waves within the ash-laden plume on Aso 1989 eruption

Akihiko Yokoo[1]; Hiromitsu Taniguchi[2]

[1] Inst. Min. Petro. Econ. Geol., Tohoku Univ.; [2] CNEAS, Tohoku Univ

It is known that volcanic eruption releases pyroclasts and gases strongly and cause pressure disturbances of ambient air. This phenomenon propagate ranged from a few to thousands km distance from the volcano. For example, Kurakatau 1883 eruption generated strong pressure perturbations it was detected at Tokyo, about 6000 km away from the volcano. Bezymianny 1956 eruption and Mt. St. Helens 1980 eruption also made pressure perturbations all over the world. These perturbations of atmosphere were sometimes observed as flashing arcs, which is visualized by phase change of H₂O in the air produced by 'strong' shock waves. These phenomenons were first recognized by Perret [1912] at Vesuvius and some observations at other volcanoes still now (e.g. Ngauruhoe, Sakurajima, and Izu-Oshima volcanoes). At Tolbatchik volcanic area (Kamchatka) in 1975, similar phenomena, which was the propagation of dense cloud layers through the eruption column, were occurred. Their velocity were very high; the order of 1-3 km/s. Livshits & Bolkhovitinov [1977] assumed that it was deduced by the gas flows or 'weak' pressure waves from the interior. We think that such propagation of weak pressure wave may be common in volcanic eruption but we don't know them because of these phenomena is not seen easily. If we know the process of these phenomena, good understanding of volcanisms will be proceeding. In this presentation, to take the case of Aso 1989 eruption, we will report the method to visualize these weak pressure waves within the eruption column on the movies and also discuss their dynamics.