

2-D Numerical Simulation of Eruption Clouds : Effects of Ash's Heat and Entrainment

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Mixing of eruption cloud and air is one of the most important processes for eruption cloud dynamics. The critical condition of eruption types (eruption column or pyroclastic flow) depends on efficiency of mixing of eruption cloud and air. We solved this problem by a 2-D numerical model which treated eruption clouds as compressible gas. We assumed that eruption cloud erupted from circular vent on the flat surface of the earth. The equation of state for the mixture of air and eruption cloud is expressed by changing their ratio of specific heat. As a result, we could simulate dynamics of turbulent mixing of eruption cloud and air, and some typical characteristics of the high-pressure and high-velocity jet such as complex shock-waves near the vent.