

# Relationships between caldera scale and the contraction conditions of a magma chamber

# Shigekazu Kusumoto[1]; Keiji Takemura[2]

[1] School of Marine Sci. & Tech., Tokai Univ.; [2] Beppu Geo. Res. Labo., Grad. Sci., Kyoto Univ.

In this study, collapse of the magma chamber was approximated by the contraction of a small sphere in an elastic medium, and the relationship between the caldera scale and the contraction conditions of the magma chamber was discussed by evaluating the stress field. As a result, the followings were found. 1) Increase of the collapse of the magma chamber spread out the plastic/rupture area (caldera) on the surface toward outside. 2) Increase of the depth of the magma chamber obstructs the formation of the large-scale caldera. If the radius of the magma chamber is same, in initial stage (minimum collapse for caldera formation), deep chamber forms larger caldera than one formed by shallow chamber. However, if the amount of collapse of the magma chamber increase, scale of the caldera caused by the shallow chamber became larger than one formed by the deep chamber. Growth rate of the caldera formed by the shallow magma chamber was higher than one formed by the deep chamber.