

Effects of H₂O content on cooling and crystallization in granitic magma chambers

Koshi Nishimura[1]

[1] Earth and Planetary Sci., Kyushu Univ

After a granitic magma chamber cools for a certain period, the whole magma in the chamber has been thought to be in a state of crystal mush with a high crystal content. However, thermal modeling of an H₂O-rich granitic chamber, which takes into account the melt fraction at the solidus temperature, indicates that crystallization within the chamber is mostly confined to the solid-magma boundary and a crystal-poor magma can exist in the chamber interior throughout its cooling history. This result implies that clear seismic reflection is expected along the solid-magma boundary throughout the cooling history. This feature is unique to silicic magma and would offer the key to estimating magma compositions in the chambers from the seismic data.