

## Geodesy can detect decades-old subsurface dike intrusions

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By repeated precise leveling surveys we found some bench marks are persistently subsiding. We hypothesize that such subsidence is caused by a cooling process of a subsurface dike which had been placed in past magmatic event. We found such examples of local subsidence by the repeated precise leveling data around Izu Oshima and Sakurajima volcanoes. This hypothesis is supported by the following observation obtained the survey result in Izu-Oshima volcano: 1) The subsidence rate decreases on a decay curve suggesting a thermal process, 2) The spatial distribution of such suggested dikes is in good agreement with configuration of the vents of the past fissure eruptions derived from geological studies. If this is the case, it is interesting to note that we can identify past subsurface events by repeated leveling survey even about 50 years after the intrusion because we find such example of subsidence which lasts for decades in Izu-Oshima volcano. In this paper, we discuss the possibility a possibility to use precise leveling as a tool to detect past subsurface dyke intrusion utilizing the leveling data around Izu-Oshima and Sakurajima volcanoes.