

## Gravity changes after the 1995 eruption in Kuju Volcano

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Kuju volcano, central Kyushu, began to erupt on 11 October 1995. Repeat gravity survey was made to clarify gravity changes caused by eruption. We used Scintrex CG-3 and CG-3M gravimeters. Gravity decreases were detected around the new craters just after the eruption. After that, the rate of gravity decrease became smaller. This rapid gravity decreases may be attributed to changes of the ground water level by the vaporization of ground water heated by the magmatic fluid. Recent gravity changes about five years after the eruption may be attributed to seasonal variations of ground water level.

Kuju volcano, central Kyushu, began to erupt on 11 October 1995. And the second eruptions occurred in December 1995. After that, no eruptions occurred, but crater activities still continue. Precisely repeated gravity survey began from 14 October 1995, to clarify gravity changes caused by eruption. Repeat gravity measurements were made at intervals of a few weeks to several months. We used Scintrex CG-3 and CG-3M gravimeters to measure precise gravity change. The two-way measurement method was used to evaluate the instrumental drift and precision; we estimated the errors of observation as 10 micro gal.

Gravity decreases up to 90 micro gal, were detected in the gravity stations around the new craters in the period from 19 October 1995 to 13 January 1996. After that, the rate of gravity decrease became smaller. But the rapid gravity increases were detected in some stations (IW5 and IW6) near the new crater.

The contours of gravity changes are limited by lack of the observation stations, however it seems that a center of the gravity decrease exist in the area of the fumaroles and the new craters. Thus it is able to be thought that steam discharge from the new craters and the fumaroles causes the long-term trend of gravity decrease.

The rapid gravity decreases may be attributed to changes of the shallow ground water level by the vaporization of ground water heated by the magmatic fluid. Recent gravity changes about five years after the eruption may be attributed to seasonal variation of ground water level.

Estimation of underground mass balance that is mainly water, based on Gauss's theorem shows that the ground water recharge from the region around new craters is increasing after the eruption and about three months after, the underground water flow is gradually reaching to the equilibrium state.