

# Estimation of the Point Pressure Source at Asama Volcano, Central Japan from Vertical Deformation Detected by Precise Leveling

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Two spherical sources are presented for the Asama Volcano, Central Japan based on the Precise Leveling recorded between 1990 and 2004. After medium-scale-eruption occurred at 1 September, 2004, vertical deformation was observed using precise-leveling by Nagoya and Hokkaido Universities at southeast of Asama Volcano. Vertical deformation at northeast of Asama Volcano was frequently observed by University of Tokyo. Other models, single spherical source and dike model are also discussed. The optimal parameters are estimated using a grid search techniques. Two spherical sources model is shown to provide best solution for observed deformation. One source is estimated to a depth of 6 km and a volume change of  $-1.0 \times 10^7$  m<sup>3</sup>. Others is estimated to depth of 11 km and volume change of  $1.5 \times 10^7$  m<sup>3</sup>.

Two spherical sources were also estimated for two periods between 1935 and 1939 and between 1939 and 1953. Optimal parameters are depths of 3 km and 7 km and volume changes of  $-1.0 \times 10^6$  m<sup>3</sup>; and  $1.2 \times 10^7$  m<sup>3</sup>; for the period from 1935 to 1939. For the period from 1939 to 1953, these show depths of 3 km and 7 km and volume changes of  $1.0 \times 10^7$  m<sup>3</sup>; and  $-2.6 \times 10^7$  m<sup>3</sup>.

The optimization suggests three spherical sources of 3, 7 and 11 km exist for the period from 1935 to 2004. The deeper source is believed to be not detected because the Precise Leveling is limited to the mountain area for the two periods between 1935 and 1939 and between 1939 and 1953.