

## Three-dimensional density structure around the creep segment of the the Atotsugawa fault

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A three-dimensional (3D) density structure around the creep segment of the the Atotsugawa fault where the creep is known to occur, was estimated using a method of 3D gravity inversion.

The gravity anomaly data within the area of 30km x 30km around the Mozumi district was used for the inversion, which data was derived from the databases organized by Geological Survey of Japan (2000) and Gravity Research Group in Southwest Japan (2001). The crust within this area and shallower than 6km depth was divided into 2,354 rectangular blocks, the size of each block being 2km x 2km x 1km. This inverse problem was solved by applying a simulated annealing technique, one of the stochastic optimization methods, and estimated the mean densities of these blocks which could reproduce the observed gravity anomaly data most correctly. To reduce the effect of the nonuniqueness problem, a priori information was introduced in the solution process according to the method originally developed.

The density structure estimated is characterized by the following features:

- 1) In the deeper realm than 3km depth, the high density zone, extending in NE-SW direction, is distributed along the Atotsugawa fault.
- 2) Such density contrast is distinct in 3-5km depth realm, and becomes slightly ambiguous in the realm deeper than 5km depth.
- 3) The characteristics of the density structure are agreed well with that of the resistivity structure estimated along the survey line of the NW-SE direction intersecting this area by MT survey (Goto et al., 2005).
- 4) Seismic activities occurred along the high density zone in the 3-5km depth realm.
- 5) The high density zone changes its direction to the EW at the southeast end of this area.

Although the 3D density structure estimated here is restricted within too shallow a realm to discuss the relation with the creep phenomena directly, this provided useful information about the geological structure along the Atotsugawa fault.