

## Gravitational deformation process in Tokugotoge Pass and Mt Otakiyama, Northern Japan Alps

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Gravitationally deformed landforms in Tokugotoge Pass and Mt Otakiyama area, in the southeast of Kamikochi, Northern Japan Alps are examined on the precise topographical maps by the airborne LIDAR data. Continuous double ridges which are aligned 100-300 m in distance are the feature in the area. Ridge top depressions-double ridges do not necessarily correspond with the ENE-SWS geologic trend of the Mino Belt but accord with the existent topography, which shows that the gravitational deformation started after the formation of main topographic framework in this area. The main ridge is asymmetric, that is the southeast side is steep slope and northwest side is gentle. In the middle of the slopes, micro landforms such as uphill-facing scarplets, middle-slope small breaks, and vague downhill-facing scarplets are recognized, which suggest gravitational deformation. They develop in the limits less than 150 m in southeast side and 300 m in northwest side relative height from the main ridge, which is interpreted that deep-seated gravitational deformation proceeds northwestwards i.e dip direction of strata. Though clear landslide landforms cannot be recognized, arch-like drainage of the characteristic landslide landform and traces of rapid landslide are developed. Landforms in this area indicate the geomorphic process of the beginning of areal gravitational deformation, succeeding localization, and changing to landslides.

Keywords: gravitational deformation, LIDAR DEM data, landslides