

High density measurement of displacement and deformation of the Tertiary landslide using laser scanner

Takashi Okamoto[1]; Sumio Matsuura[1]; Shiho Asano[1]

[1] FFPRI

<http://www.ffpri.affrc.go.jp/>

The authors examined two-dimensional displacement and deformation of the Tertiary landslide mass using a laser scanner sensor. 300 points of stakes were installed in a landslide area every 5m, and the three-dimensional shape of them were measured four times. We made triangular elements of the surface using the positions of the stakes, and calculated a movements of the positions of the center of gravity.

The horizontal displacement of the landslide were strongly regulated by the side wall. The lower part of the landslide mass with shallow slip surface upheaved in autumn by pushing out of the upper part of it. The compression parts and the extension parts were distributed next to each other locally. This showed that the stress acts on a landslide changed locally.

At the central block, the expansion and the compression area were distributed adjacently. The expansion mass in the upper part displaced large and upheaved, and the compression mass in lower part displaced small and subsided. This phenomenon explains the following deformation mechanism. The upper part has an strong external force directed downward. But the lower part to be adjacent to stable ground is not permitted to move. Therefore, the upper part is displaced to run onto the lower part, and upheaves. Lower part compresses so that compression stress acts from the upper part.