



Investigation of the Avcilar Landslide, Istanbul, Turkey by VLF Method

Gokhan Karcioglu

Istanbul University, Engineering Faculty, Geophysical Engineering, Turkey (gkarci@istanbul.edu.tr)

The area around Avcilar landslide in the western slopes of Kucukcekmece Lake, Turkey is defined with clayey formations causing landslides and SE-NW oriented strike slip faults.

The study area and landslides in the area are previously investigated using 1D methods. In this study, we aimed the image near surface resistivity distribution in the Avcilar landslide using 2D interpretation methods. In order to investigate the study area in 2D, VLF method is employed due to the fast data collection and portability.

The VLF data is collected in a SW-NE traverse using 23.4 kHz frequency with 6.5m intervals. The basic interpretation of the data is realized using Karous-Hjelt filtering. Subsequently 2D modeling of the collected data is realized using a least squares inversion algorithm with smoothness constraint. Inversion is started from a homogeneous model with 20 Ω m resistivity. %5 error floor is applied for the weighting. The smooth inversion algorithm recovered the model with 2.224 RMS error.

The recovered geo-electrical model is considerably different from the results of the previous studies which are obtained using 1D interpretation methods. From the inversion results, the conductive base of the landslide is detected around \sim 25m depth, coherent with the previous predictions. Besides, two vertical conductive features are delineated at the easternmost part of the profile. A fault zone with >1km width, consisting of several small scale vertical strike slip features is known to be residing in the east of the study area. These conductors are interpreted as the westernmost part of this fault zone.