Geoelectrical and geotechnical monitoring on a landslide in Wolfsegg am Hausruck, Austria

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In May 2017 the Geological Survey of Austria (GBA) installed a geoelectrical monitoring profile and 4 automatic inclinometers on a landslide in the Hausruck of Upper Austria. Beforehand extensive geoelectrical and borehole geophysical investigations on an area of 2 ha have been conducted by the GBA as well as EM and SIP measurements were done by the Technical University of Vienna. To interpret the causes for the movement mineralogical analysis have been carried out which give in combination with the borehole logs a good indication at which depth range there is the highest probability for the development of a sliding surface. Sliding surfaces in this area are coal-clay formations and the transition zone gravel-marl. Until now, the slope has moved up to 6 mm, but without the formation of a distinct slipping plane. The main focus of the geoelectrical monitoring is to image with the interpretation of difference images of the 4D-inversion (Kim et al. 2009) the change of water saturation with time. It is expected that due to the low hydraulic permeability of sliding relevant parts of the subsurface, the changes in resistivity at this depth range will be rather small as well as not directly linked to distinct precipitation events. Therefore, the emphasis has to be dedicated to the quality of the input data for the 4D-inversion (data acquisition, filtering,…) to minimize inversion artefacts that could mask the relevant subsurface information. Furthermore, for a reliable interpretation a long-term observation is essential. First results of the geoelectrical monitoring profile will be presented, showing the very near surface effects of precipitation events that have not reached the sliding prone depth ranges yet. This finding is also supported by the fact that almost no displacement took place in the same period of time. Due to the operation of diverse monitoring systems (the installation permanent FO cables is planned for spring) and different geophysical and geotechnical investigations that took place at this site (good knowledge about the subsurface structure) a detailed and reliable interpretation of long-term resistivity changes in connection with the landslide dynamics is expected.

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REFERENCE

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