Geophysical Research Abstracts
Vol. 18, EGU2016-12721-2, 2016
EGU General Assembly 2016

Analysis of ERT data of geoelectrical permafrost monitoring on Hoher Sonnblick (Austrian Central Alps)

Stefan Pfeiler (1), Wolfgang Schöner (2), Stefan Reisenhofer (3), David Ottowitz (1), Birgit Jochum (1), Jung-Ho Kim (4), Stefan Hoyer (1), Robert Supper (1), and Georg Heinrich (2)

(1) Department of Geophysics, Geological Survey of Austria, Vienna, Austria (stefan.pfeiler@geologie.ac.at), (2) Institut für Geographie und Raumforschung, University of Graz, Graz, Austria(wolfgang.schoener@uni-graz.at), (3) Zentralanstalt für Meteorologie und Geodynamik (ZAMG), Vienna, Austria (stefan.reisenhofer@zamg.ac.at), (4) Korea Institute of Geoscience and Mineral Resources (KIGAM), Daejeon, Korea (jungho@kigam.re.kr)

In the Alps infrastructure facilities such as roads, routes or buildings are affected by the changes of permafrost, which often cause enormous reparation costs. Investigation on degradation of Alpine Permafrost in the last decade has increased, however, the understanding of the permafrost changes inducing its atmospheric forcing processes is still insufficient. Within the project ATMOperm the application of the geoelectrical method to estimate thawing layer thickness for mountain permafrost is investigated near the highest meteorological observatory of Austria on the Hoher Sonnblick. Therefore, it is necessary to further optimize the transformation of ERT data to thermal changes in the subsurface. Based on an innovative time lapse inversion routine for ERT data (Kim J.-H. et al 2013) a newly developed data analysis software tool developed by Kim Jung-Ho (KIGAM) in cooperation with the Geophysics group of the Geological Survey of Austria allows the statistical analysis of the entire sample set of each and every data point measured by the geoelectrical monitoring instrument. This gives on the one hand of course an enhanced opportunity to separate between „good“ and „bad“ data points in order to assess the quality of measurements. On the other hand, the results of the statistical analysis define the impact of every single data point on the inversion routine. The interpretation of the inversion results will be supplemented by temperature logs from selected boreholes along the ERT profile as well as climatic parameters.

KIM J.-H., SUPPER R., TSOURLOS P. and YI M.-J.: Four-dimensional inversion of resistivity monitoring data through Lp norm minimizations. – Geophysical Journal International, 195(3), 1640-1656, 2013. Doi: 10.1093/gji/ggt324. (No OA)

Acknowledgments: The geoelectrical monitoring on Hoher Sonnblick has been installed and is operated in the frame of the project ATMOperm (Atmosphere - permafrost relationship in the Austrian Alps - atmospheric extreme events and their relevance for the mean state of the active layer) funded by the Austrian Academy of Science (ÖAW)