**Geophysical detection of caves to prevent natural hazards – Two case studies from Lower Austria**

Barbara Funk1,2, Adrian Flores-Orozco1 and Lukas Plan2

1Geophysical Institute, TU-Wien, Karlsplatz 13, 1040 Vienna, Austria, email: barbara.funk@tuwien.ac.at

2Karst and Cave Group, Natural History MuseumVienna, Museumsplatz 1/10, 1070 Vienna, Austria

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

# KEYWORDS

Electrical resistivity tomography, ground penetrating radar, caves individual: Forststraßeneinbruch (1823/64), Stiegengraben Wasserhöhle (1823/25)

# ABSTRACT

The study area is located near Lunz in the Northern Calcareous pre-Alps at the contact of well bedded limestone (Opponitz Formation) and massive dolomite (Hauptdolomit). At the study area electrical resistivity tomography (ERT) and ground penetrating radar (GPR) have been performed to gain information about changes in the electrical properties of the subsurface that could help in the delineation of the cave system. Two case studies are presented: (1) the Forststraßeneinbruch and the (2) Stiegengraben Wasserhöhle. The Forststraßeneinbruch was first reported due to a hole opened in a forest road in December 2016. The aim of the geophysical investigation was to delineate the location of further surface near caves that potentially collapse. The Stiegengraben Wasserhöhle is a 1 km-long cave buried by gravel during the construction of a forest road in the 1970’s and by a lot of fine grained material recently. It is feared that due to the plugging of the spring inside the cave the water pressure could rise and mobilize the unconsolidated material, which could result in a debris flow, endangering the houses in the valley below. Here the geophysical investigation aims at identifying the geometry of the cave, as well as the accumulation of fine materials, or water saturated voids. Our results show that ERT is a well suited method which permits to gain detailed information on the geometry and interconnection of the cave system. GPR permits a faster data collection, yet the interpretation of such data is highly improved using the ERT results.