



## High resolution geophysical prospecting for the delineation of subsurface archaeological objects

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Objects of archaeological interest like foundations of ancient buildings are commonly covered by layers of sediments. Although these layers are often not very thick, these objects are hidden to the eye. Different geophysical methods are available to get more insight into the subsurface, but to get results which are sufficient to the archaeologist; very high resolution has to be achieved. Therefore, and this is common in geophysics, the measurement method and the field parameters had to be optimised for the specific search object. In the forefront of such an investigation prior numerical modelling, collecting of available petrophysical parameters of the typical materials and geologic surroundings and some test profiles are necessary to optimize the field parameters to depth range and resolution. In the specific task presented, foundations of ancient buildings and graves had to be outlined. The results of different methods and the procedures to find the optimum methods and field parameters are presented.

The methods from which results are presented are visual and infrared aerial photography, geoelectric mapping and multielectrode geoelectric tomography, magnetic, electromagnetic, SP and susceptibility measurements. A comparison of the results will be shown and the differences will be discussed. In the specific case a special geoelectrical mapping procedure gave the best results. Also infrared airborne photography showed good resolution. Unfortunately the exact location and the dimensions of the objects could not be deduced from the available aerial pictures. Combining these infrared aerial pictures with the results of the ground based geoelectric mapping gives in the specific case the best results. The aerial pictures show indications of the interesting objects and with the geoelectric method

the exact location of these foundations could be found and outlined with lot of details.

The prospecting method had been applied to some of the remaining foundations of the roman city of Virunum, a local roman provincial capital, located in southern carinthia. Fundaments of a church, dated by the archaeologists to the early time of the Christians and a nearby building had been outlined.

Based on these results the archaeologists of the Carinthian museum started a digging campagne. Up to now part of the apsis had been digged out. Photos of these fundaments will be shown. The digging results show good agreement with the geophysical results.

A second object which has been investigated is an assumed ancient hill grave. Also this object had been investigated with geophysical methods. The main grave is also recognisable as small hill in the landscape. Beside this main object also a second similar structure had been found. On both objects no digging has been done jet. The archaeological description of the objects had been published by H. Dolenz et.al. in the journal *Rudolfinum* published by the "Landesmuseum" of Carinthia (Klagenfurt). The fieldwork and part of the interpretation had been done by students of the University of Leoben within summer field camps. This work had been also kindly supported by H. Dolenz from the Landesmuseum Kärnten.