Geophysical Research Abstracts, Vol. 7, 06441, 2005
SRef-ID: 1607-7962/gra/EGU05-A-06441

Neolithic flint-mines in Arnhofen, Southern Germany: a ground penetrating radar survey as a planing tool for archaeological excavation

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Ground penetrating radar (GPR) was used at an excavation site of a Neolithic flint mine in Southern Germany to establish the subsurface geology of the mined and to aid in the location of mine shafts in areas not archaeologically excavated.

The Neolithic flint mines located near the village of Arnhofen about 15 km southwest of Regensburg in Southern Germany, were discovered in the 1980's during the expansion of a sand and gravel pit. Excavations, carried out as part of an extensive archaeological project (1998 to 2001), revealed hundreds of shafts dug by the Neolithic people in their attempts to obtain high-quality flint stone for the manufacturing of tools. The former extension of the mining area is only partly known. The application of geophysical methods (refraction seismic and magnetic survey) showed contrary results. Whereas shallow refraction seismic showed correlating results with shaft locations documented by air photography, a magnetic survey indicated a different distribution of the former mine area. So ground penetrating radar was applied for determining potential sites for future archaeological excavations and for establishing the subsurface continuity of the geologic units at the site.

Three radar facies were identified to characterize the geology of the study area. A test GPR line surveying known Neolithic mine shafts provided calibrated results for the identification of new shafts. Several hundred meters of radar lines identified the locations of previously unknown shafts in archaeologic unexplored areas. The GPR results provide archaeologists with valuable additional information on the extent of the former flint mine.