

COMBINED USE OF EMR (GEORADAR) AND GEOELECTRICAL MEASUREMENTS TO INVESTIGATE THE SHALLOW SUBSURFACE STRUCTURES

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A basic target in hydrogeological investigations is to get information on the water content and porosity of the underground. These parameters can be related to the physical properties of the formation such as electrical resistivity and permittivity.

The shallow subsurface is a heterogeneous mixture of petrologic component, pore filling, and air. Due to formation and weathering processes, the shallow subsurface is not uniform. These processes produced patterns with different grain size distribution. The internal heterogeneities of sedimentary sequences are generally present in most hydrological settings and are determined primarily by different water content in the subsurface material.

Coverage of these spatial variations may be quantitatively mapped and described with great effectiveness by using both electromagnetic reflection method (EMR, georadar) and DC-geolectric. Structures detected by EMR denote variation in the electrical permittivity while detected by DC-geolectric signify variation in the electrical resistivity.

The combined application of both methods for determining geometry, material as well as lateral and vertical extension of the shallow subsurface heterogeneities will be demonstrated.