



Airborne Radiometrics and Comparison with Activity Measurements in Groundwater

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Airborne geophysical measurements including magnetics, electromagnetics and radiometry were carried out in a 312 sqkm large area in eastern Bavaria comprising crystalline rocks and Cenozoic sediments. The helicopter-borne investigations of 2007 were accompanied by ground-borne gamma spectroscopy and radon activity measurements in groundwater outcrops.

The comparison of the radiometric data gathered allows to delineate hidden granitic intrusions and to distinguish between different intrusive phases of the igneous rocks suites. Furthermore fault systems can be mapped or proved and the depth of the weathering zone in hard rock areas can be roughly assessed in certain areas, both crucial for groundwater exploitation in hard rock environment. Besides that, hydrogeological implications from airborne data are scarce, due to the great heterogeneity of the geological background. Rn-222 activity measurements at springs using liquid scintillation counter (LSC) technique, however, proved to be a simple method to distinguish waters otherwise chemically indistinct. Even though not an intrinsic property of groundwater but a geological parameter measured in groundwater, radon measurements, especially multiple measurements and time series additionally may provide useful information for groundwater monitoring: Time dependent variations of radon concentrations can be correlated with fluctuations of areal precipitation and thus indicate the varying impact of surface run-off or shallow groundwater of superficial deposits. The basic difference in radiometric characteristics of groundwater and surface water can also be utilized in monitoring the hydrological regime (infiltration vs. exfiltration) within river valleys.