Geophysical Research Abstracts, Vol. 9, 09190, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-09190

Multi-Channel GPR for Rapid Simultaneous Estimation of Reflector Depth and Soil Water Content

H. Gerhards, U. Wollschläger, P. Schiwek, K. Roth
Institut of Environmental Physics, University of Heidelberg

Ground penetrating radar (GPR) measurements of soil water content are based on dielectric permittivity. However, in a common offset measurement the dielectric permittivity and the reflector depth cannot be determined independently. This is typically resolved by soil coring or common midpoint measurements. These are not practical in situation with lateral variation.

We will present a fast multi-channel GPR application to estimate reflector depth and the average soil water content above this reflection simultaneously. An example is shown to demonstrate its applicability for field scale measurements in an environment with large lateral variability of the water content. Furthermore, the statistical and biased errors are examined, such as the error from the air gap caused by soil roughness and the error from picking procedure.