



Estimation of Soil Horizons Thicknesses Using GPR

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In our study we try to detect soil horizons' boundaries using ground penetrating radar (GPR) We focus on O horizon and topsoil (A horizon) thickness. Survey, performed by using MALA Ground Penetrating Radar with 800 MHz antenna, was carried out under different conditions: Cambisol on acid metamorphic rocks, Arenic Podzsol on sandstone, Stagnosol on serpentinite, and Histic Gleysol on granite. All measurements were performed along uncovered soil profiles permitting a precise documentation of the soil horizon boundaries, bigger stones and tree roots to depth of 70 cm to compare the GPR results with the field profile documentation. The acquired data were processed and visualised using radargrams. Electromagnetic signal velocity was assessed from soil permittivity measured using a TDR probe. The most evident organic/mineral boundaries were detected in Stagnosol thanks to very important profile textural differentiation. In Histic Gleysol the signal attenuation was considerable showing clearly only vegetation rooting zone boundary situated in the uppermost part of the soil profile. The interpretation of Cambisol and Podzsol radargrams was less clear because of low textural differentiation of the profiles. Moreover, radargram interpretation was made more difficult by the presence of stones and tree roots which disrupted GPR signal reflections.