



Title: Potential of GPR full-waveform inversion of hydrogeological



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When: 28th November 2023 at 4 p.m. (CET)



Where: This will be a hybrid event. Further details on how to attend will



be provided in time.

Abstract: The heterogeneous critical zone consists of the complex interactions between rock, soil, water, air, and living organisms, which determine the availability of life-sustaining resources such as water. This environment has been increasingly exploited for human needs, such as water supply, to store our waste and agriculture. To assess the environmental risk associated with such exploration, the critical zone has to be characterized with high resolution methods to enhance our understanding of hydrological processes. In this presentation, we will focus on the potential of ground penetrating radar (GPR) to investigate small-scale structures and related processes in the critical zone.

GPR can be applied to a wide range of applications to solve geological, hydrogeophysical, permafrost and civil engineering questions, to name just a few examples. Especially, the GPR full-waveform inversion (FWI) demonstrated in the last decade the benefits of an improved high-resolution method to assess geological and hydrological subsurface properties that could be linked to relevant processes. This presentation will emphasize the recent developments and applications that we accomplished in the last years using novel GPR algorithms ranging from large-scale high resolution aquifer characterization, towards the investigation of flow and transport processes. These examples demonstrate the significant role that GPR and the FWI can have to enhance our critical zone characterization to support management decisions.