

报告题目: 风化壳结构三维参量化表征及其工程意义

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摘要: 受地质构造和地形起伏等多种因素影响, 块状岩体的风化壳结构具有空间变化不确定性的复杂特征, 所关注参量需要从立体空间上给予表征。借助二维地球物理勘探技术和三维成像方法, 将地质剖面岩体完整性系数  $K_v$ 、钻孔岩心完整性 RQD 指标, 以及钻孔水文地质试验测得渗透系数  $K$  和导水率  $T$  结合起来, 以提升后面这些低维参量的维数, 得到岩体结构和水文地质参量在三维空间的分布变化情况。结合中国散裂中子源 CSNS、强流重离子加速器 (HIAF) 和加速器驱动嬗变研究装置 (CIADS) 场址工程地质勘察工作, 分析得到风化壳结构相关的  $K_v$ 、 $K$  和  $T$  参量的空间分布, 为工程规划设计提供了重要的量化依据。

关键词: 风化壳, 三维, 工程地质勘察, 参量

### **3D Parametric Characterization of Weathering Crust Structure and Its Engineering Significance**

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Abstract: Due to the influence of many factors such as geological structure and topographic relief, the weathering crust structure of massive rock mass has the complex spatial variation and uncertainty, and the concerned parameters need to be characterized in 3D space. With the help of 2D geophysical exploration technology and 3D imaging method, the rock mass integrity coefficient  $K_v$  of geological survey points, the RQD index of borehole core integrity, as well as the permeability coefficient  $K$  and hydraulic conductivity  $T$  measured by borehole hydrogeological test are combined to increase the dimensions of these low-dimensional parameters. Thus, the 3D spatial distribution and changes of rock mass structure and hydrogeological parameters can be obtained. Combined with the engineering geological survey of China spallation neutron source CSNS, HIAF and CIADS site, the spatial distributions of  $K_v$ ,  $K$  and  $T$  parameters related to weathering crust structure are obtained and analysed, which provides an important quantitative basis for planning and design of such kind of Large scale Scientific Research Infrastructures.

Keywords: Weathering crust, 3D, Engineering geological investigation, Argument