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围岩变形的时效特征与预测的研究

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摘要　在假设围岩地层的性态服从三元件粘弹性模型的基础上，结合对宜兴抽水蓄能电站地下厂房试验洞位移量测数据的分析，提出一种确定地层时效特征参数和预报地层变形的方法。内容包括在考虑试验洞开挖面空间效应影响的前提下对现埋孔的位移量进行修正。根据位移－时间关系曲线的回归方程建立任意时刻围岩地层等效弹性模量间的关系式，给出确定三元件粘弹性模型参数值及对洞周地层的变形进行预报的方法。研究表明：位移量的预报值与回归值可较好吻合，表明这一方法可供同类工程采用。

关键词　岩石力学；流变特性；粘弹性模型；围岩变形预报；反分析方法

分类号

STUDY ON TIME-DEPENDENT PROPERTIES AND DEFORMATION PREDICTION OF SURROUNDING ROCK

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Abstract

Based on the assumption that the behavior of surrounding rocks conforms to that of Kelvin-Voigt model，a method to determine the parameters related to the time-dependent properties of surrounding rocks is established and the ground displacement of a test tunnel of an underground hydro-power station cavern is predicted by using the measured data. The measured data is revised to consider the space effect of excavation face. The total displacement values are treated by regression to derive the displacement-time curves. The formula to describe the relation between equivalent elastic modulus of the surrounding rock and the displacement values at different moments is also established. The case study shows that the predicted displacements by the method agree well with the measured values，so the proposed method can be adopted in practice.

Key words　rock mechanics；rock rheology；visco-elastic model；surrounding rock deformation prediction；back analysis

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