

论文

岩石脆性临界破坏视电阻率变化与应力比

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摘要:

针对岩体破坏过程中电阻率变化问题, 分析了岩石受载变形破坏过程中电阻率的演化规律, 利用重整化群理论并结合岩石压缩破坏试验, 研究分析岩石电阻率变化与岩石变形破坏演化阶段之间的关系, 在此基础上推导出了受载条件下岩石破裂前电阻率突变所对应的应力和岩石峰值应力比值的表达式, 实验室加载情况下其值大都在70%~80%, 同时根据相关实验数据应力比均值约为75%, 误差在±9%之内, 验证了分析的合理性。

关键词: 岩石; 视电阻率; 应力比; 重整化群

Analysis on rock resistivity variation with stress ratio at the state of critical brittle failure

Abstract:

Aiming at the changing of apparent resistivity in rock failure process, the resistivity variation was analyzed. Analyzing the relationship of resistivity and rock compression process under loading based on renormalization group theory, the micro-mechanism of resistivity evolution can be described as follow: the expanding and interaction of micro-cracks lead the changing. Combining rock uniaxial compression results, it is shown that the stress ratio between the resistivity mutation of critical state and peaking state has a value range from 70% to 80%. According to the test data, it can be got that the stress ratio between critical points, has a value of nearly to 75%, and the deviation is less than ±9%.

Keywords: rock; apparent resistivity; stress ratio; renormalization group

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