岩石力学与工程学报 2005 24 (15): 2665 ISSN: 1000-6915 CN: 42-1397/O3

非贯通裂隙介质裂隙扩展规律的CT试验研究

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收稿日期 2004-3-30 修回日期 2004-5-17 网络版发布日期 2007-2-13 接受日期 2004-3-30

摘要 利用非贯通裂隙试件在加载过程中的实时CT扫描以及CT图像的三维重建技术，对非贯通裂隙介质在单轴压缩过程中的裂隙扩展规律进行了试验研究。通过对破坏后试件进行高密度CT扫描，重建了破坏后试件的三维CT图像；利用三维CT图像，对试件内部任意方向上裂隙扩展情况进行观察分析，得到了不同成因裂纹的扩展规律；在二维CT图像的基础上，绘制出不同应力水平扫描断面上损伤演化等值线图，根据试件内部损伤演化过程，对裂隙扩展机理进行了分析。

关键词 岩土力学；非贯通裂隙介质；破裂过程；三维CT图像；损伤等值线图

分类号

RESEARCH ON CRACK DEVELOPING PROCESS IN NON-INTERPENETRATED CRACK MEDIA BY USING CT

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Abstract

Non-interpenetrated crack concrete specimens are used to study the crack developing process in non-interpenetrated crack media under uniaxial loading. The specimen is a cubic pillar of 10 mm×10 mm×21 mm in size with non-interpenetrated pre-existing cracks which are inclined to the loading direction at 30°，45°，60°，90°，respectively. The in-time CT scanning is made in the process of uniaxial loading and 3D CT images are reconstructed to detect crack developing process. Based on the CT images，damage isoline of scanning section is drawn to describe quantitatively the process of crack developing. The study shows the different effects of two kinds of damage (crack and micro crack) on crack developing process.

Key words rock and soil mechanics；non-interpenetrated crack media；failure crack developing process；3D CT image；damage isoline

DOI:

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