

轴对称压缩条件下岩石局部化剪切带数值模拟

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摘要 在岩石室内试验中, 可以很清楚地观察到试样在失稳过程中常常伴随着宏观剪切带(破裂面)的形成。根据相关试验规程和标准规定的试样形状、尺寸和试验条件, 采用FLAC3D软件, 对岩石试样在轴对称压缩(单轴或常规三轴)条件下局部化剪切带的形成过程进行数值模拟, 取得的结果与相关试验结果基本一致。

关键词 [岩石力学; 轴对称压缩; 局部化剪切带; 数值模拟](#)

分类号

NUMERICAL SIMULATION OF STRAIN LOCALIZATION SHEAR-BANDS OF ROCKS UNDER AXIAL SYMMETRIC COMPRESSION

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Abstract

In laboratory tests of rocks, the macro shear-bands can be observed clearly during the collapse of the specimens. According to the relative standards and specifications for rock tests, the specimens which have standard shape and size and standard test conditions are taken. With software FLAC3D, the formation processes of localization shear-bands of rock specimens under axial symmetric compression are simulated. Under the uniaxial compression, the formation of strain localization of the rock specimen is steady. With the increase of the axial strain of the rock specimen, the localization network forms firstly, then approaches in an inclined section and forms a macroscale shear band finally. Under the general triaxial compression, when the lateral pressure is not very high, the formation process of the rock specimen is very similar with that under the uniaxial compression. But when the lateral pressure is very high, no macroscale shear-band forms when the rock specimen fails. The inclination angles of the shear-bands of rock specimens are almost the same under several lateral pressures, and all are less than the Mohr-Coulomb fracture angle. The complete stress-strain curves of rock specimens present similar laws. The numerical simulation results are basically consistent with test results.

Key words [rock mechanics; axial symmetric compression; localization shear-bands; numerical simulation](#)

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