

## 脆性岩石卸围压试验与岩爆机理研究

陈卫忠<sup>1</sup>, 郭小红<sup>2</sup>, 吕森鹏<sup>1</sup>, 乔春江<sup>2\*</sup>

1. 中国科学院武汉岩土力学研究所
2. 中交第二公路勘察设计研究院

## Unloading confining pressure for brittle rock and mechanism of rock burst

摘要

参考文献

相关文章

Download: [PDF](#) (814KB) | [HTML](#) 1KB | Export: [BibTeX](#) or [EndNote](#) (RIS) | [Supporting Info](#)

**摘要** 岩爆是高地应力区地下工程开挖卸荷产生的动力现象。按照地下工程开挖卸荷特点, 开展了脆性花岗岩常规三轴、不同卸载速率条件下峰前、峰后三轴卸围压试验, 研究了岩石破坏的全过程并进行了声发射特征分析, 探讨了岩爆岩石的变形破坏特征和岩爆形成力学机制。试验结果表明: 无论是峰前还是峰后卸围压, 高地应力下花岗岩都表现脆性破坏特征, 峰前卸围压时岩样表现出的脆性比峰后卸围压更为强烈; 卸载速率越快, 岩石脆性破坏越强, 发生岩爆的可能性越大。试验研究成果对地下工程岩爆发生的机理研究和预测提供了试验依据。

**关键词:** 岩爆机理 卸荷 三轴试验 变形 破坏特征

**Abstract:** Rock burst is often met in excavation unloading of underground engineering in high geo-stress areas. According to the actual stress state on surrounding rock, conventional triaxial and unloading confining stress laboratory tests are conducted for brittle rock during pre-peak strength and post-peak strength. The full-regime of the rock failure is analyzed and the characteristics of acoustic emission in the process of rock failure are studied. The rock deformation-failure characteristics and the mechanical mechanism of the rock burst are discussed. The test results show that the rock samples all exhibit brittle failures in pre-peak and post-peak unloading confining tests and the brittle characteristics in the pre-peak tests are stronger than those in the post-peak tests. The brittle failures of rock are more intensive with high unloading rate, and the probability of rock burst is larger. The characteristics of the rock burst are summarized. These results are helpful to the researches on the mechanical mechanism of rock burst.

**Keywords:** mechanism of rock burst unloading triaxial test deformation failure mechanism

Received 2009-01-08; published 2011-03-09

Fund: 国家“863”科技项目(2006AA11Z118); 中国科学院“西部行动计划高新技术”项目(KGCX2-YW-506); 国家自然科学基金项目(40772184, 50720135906)

Corresponding Authors: 陈卫忠 Email: wzchen@whrsm.ac.cn

### 引用本文:

陈卫忠 郭小红 吕森鹏 乔春江. 脆性岩石卸围压试验与岩爆机理研究 [J] 岩土工程学报, 2010, V32(6): 0-0

.Unloading confining pressure for brittle rock and mechanism of rock burst[J] Chinese J. Geot. Eng., 2010, V32(6): 0-0

### 链接本文:

[http://218.241.156.197/Jwk\\_ytgxcb/CN/](http://218.241.156.197/Jwk_ytgxcb/CN/) 或 [http://218.241.156.197/Jwk\\_ytgxcb/CN/Y2010/V32/I6/0](http://218.241.156.197/Jwk_ytgxcb/CN/Y2010/V32/I6/0)

### Service

- [把本文推荐给朋友](#)
- [加入我的书架](#)
- [加入引用管理器](#)
- [Email Alert](#)
- [RSS](#)

### 作者相关文章

- [陈卫忠](#)
- [郭小红](#)
- [吕森鹏](#)
- [乔春江](#)