

论文

煤矿岩巷毫秒延期爆破振动测试与控制技术研究

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摘要:

为了提高煤矿硬岩巷道掘进爆破效果、降低爆破振动效应,对毫秒延期爆破参数进行优化及实施,实测爆破振动速度。分析了爆破参数与爆破振动信号特征之间的关联性,针对电雷管存在延期误差,应用小波变换时-能密度法识别确定毫秒爆破中实际延期时间,提出了降低爆破振动效应的技术措施。研究表明:采用合理的毫秒延期爆破参数方案,可以取得良好的爆破效果;垂直方向爆破质点峰值振速可以作为煤矿岩巷的安全判据;时-能密度法能够有效地识别出各段雷管的起爆时刻,确定实际延期时间。

关键词: 毫秒延期爆破; 振动效应; 振动监测; 延期时间; 时-能密度分析法

Research on testing and controlling techniques of millisecond delay blasting vibration in coal mine rock roadway

Abstract:

In order to improve the blasting effect and reduce the blasting vibration in hard rock roadway, the millisecond delay blasting parameters were optimized and implemented, and the velocity of blasting vibration was measured. The correlation between blasting parameters and characteristics of blasting vibration signal was analyzed. For delay errors of electric detonators, the method of time-energy density analysis based on wavelet transform was adopted to identify the real delay time in millisecond blasting, and technical measures for reducing the blasting effect were put forward. The results show that a good blasting effect could be obtained by using reasonable millisecond delay blasting parameters, and the vertical peak particle velocity of blasting vibration can be taken as safety criterion for rock roadway. The method of time-energy density analysis can identify the blasting moment of detonators and ascertain the real delay time effectively.

Keywords: millisecond delay blasting; vibration effect; vibration monitoring; delay time; method of time-energy density analysis

收稿日期 2012-10-15 修回日期 2012-11-16 网络版发布日期 2013-03-05

DOI:

基金项目:

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