

隧道电子雷管爆破降振技术试验研究

傅洪贤¹, 沈周², 赵勇³, 王树强⁴, 唐勇², 严秀成², 程龙先^{2*}

(1. 北京交通大学 隧道与地下工程教育部工程研究中心, 北京 100044; 2. 中铁十局集团有限公司, 山东 济南 250101; 3. 铁道部工程设计鉴定中心, 北京 100844; 4. 铁道部成都铁路局, 四川 成都 610082)

EXPERIMENTAL STUDY OF DECREASING VIBRATION TECHNOLOGY OF TUNNEL BLASTING WITH DIGITAL DETONATOR

FU Hongxian¹, SHEN Zhou², ZHAO Yong³, WANG Shuqiang⁴, TANG Yong², YAN Xiucheng², CHENG Longxian^{2*}

(1. Tunnel and Underground Engineering Research Center of Ministry of Education, Beijing Jiaotong University, Beijing 100044, China; 2. China Railway 10 th Co., Ltd., Jinan, Shandong 250101, China; 3. Appraisal Center of Engineering Design, Ministry of Railways, Beijing 100844, China; 4. Chengdu Railway Bureau, Ministry of Railways, Chengdu, Sichuan 610082, China)

摘要

参考文献

相关文章

Download: [PDF](#) (1025KB) [HTML](#) 1KB Export: [BibTeX](#) or [EndNote](#) (RIS) [Supporting Info](#)

摘要 电子雷管是一种延期时间可以根据实际需要任意设定并精确实现发火延时的新型电能起爆器材,是近年来起爆器材领域里新进展之一,被称为爆破技术的一场革命。结合兰渝铁路的建设,在人和场隧道进行电子雷管降振试验、电子雷管与非电雷管联合降振试验,对隧道电子雷管爆破降振机制进行研究,优化隧道炮眼的延时时间,研究电子雷管与非电雷管的衔接方法,取得隧道电子雷管单孔连续起爆降振技术和电子雷管与非电雷管联合降振技术。隧道电子雷管单孔连续起爆降振技术,与隧道非电雷管爆破相比,在爆破进尺不变的情况下,爆破振动降低80%以上;在爆破进尺增加25%的情况下,爆破振动降低50%以上。隧道电子雷管与非电雷管联合降振技术,与隧道非电雷管爆破相比,在爆破进尺增加25%的情况下,爆破振动降低40%以上。隧道电子雷管单孔连续起爆降振技术的炮眼间延时间隔时间对隧道爆破的效果至关重要,炮眼间延时间隔时间过大,影响隧道的爆破进尺和岩石破碎效果;炮眼间延时间隔时间过小降振效果不明显,有时振动反而增大。隧道电子雷管降振技术,不但解决复杂环境下铁路隧道的施工问题,该技术也可在城市公路隧道中进行应用,已取得良好的社会效益,对类似工程具有很好的指导意义。

关键词: [隧道工程](#) [电子雷管](#) [振动测试](#) [降低振动](#)

Abstract: Digital detonator's delay time is arbitrarily set up according to field requirement and its delay time is very accurate. Digital detonator is one of the most advanced detonators, and is leading the revolution of blasting technology. Several experiments of building tunnels with digital detonator blasting are tried out in Renhechang tunnel of Lanzhou—Chongqing railway, decreasing blasting vibration mechanism with digital detonator is studied. The optimal delay time of blast hole of tunnel is gained; technology of tunnel digital detonator blasting one by one hole is put forward, the blasting vibration is decreased at least 80% in the same blasting advance with detonator blasting with shock-conducting tube, and at least 50% at increasing 25% of blasting advance. Several mixed networks of digital detonator and detonator with shock-conducting tube are tried in order to reduce the blasting cost of tunnel. The optimal joint technology is put forward, the blasting vibration is decreased at least 40% at increasing 25% of blasting advance. The interval between blasting hole delay time greatly affect the result of tunnel blasting, the longer interval between blasting hole delay time result in shorter blasting advance of tunnel and bad fragment, the shorter interval result does not decrease blasting vibration, sometimes increases blasting vibration. The experimental results settle the problem of blasting building railway tunnel in complicated environment, and are also applied to city highway tunnels, the social and economic benefits are acquired. The study result can provide references for tunnel in complicated environment.

Keywords: [tunnelling engineering](#) [digital detonator](#) [blasting vibration measurement](#) [decreasing vibration](#)

Received 2011-10-31;

引用本文:

傅洪贤¹, 沈周², 赵勇³, 王树强⁴, 唐勇², 严秀成², 程龙先².隧道电子雷管爆破降振技术试验研究[J] 岩石力学与工程学报, 2012,V31(3): 597-603

.EXPERIMENTAL STUDY OF DECREASING VIBRATION TECHNOLOGY OF TUNNEL BLASTING WITH DIGITAL DETONATOR[J] , 2012,V31(3): 597-603

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