

论文

组合爆破法TSP超前地质预报研究

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摘要:

为同时提高TSP隧道地震波超前地质预报距离和精度,采用组合爆破法改进了原TSP超前地质预报信号触发方式,提出了激发孔中心距经验公式.选用延时误差为几微秒或零点儿微秒的瞬发雷管,引进延时测量仪测量雷管起爆延时,可有效减少地震波信号走时误差,提高预报准确度.采用组合爆破法可同时获得高能量与高频率的地震波信号,使超前地质预报在距离和精度两方面均得到了提高.该方法在宜万铁路云雾山隧道、沪蓉西高速齐岳山隧道和龙潭隧道得到了成功应用.

关键词: 组合爆破 TSP 地震波 超前地质预报 延时误差

Studies on combined blasting method of the TSP advanced geological prediction

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Abstract:

In order to simultaneously get long distance and better precision of tunnel seismic prediction(TSP), the combined blasting method was adopted to ameliorate trigger modes of seismic signals in the TSP advanced geological preeiction. The empirical formula of the center distance between the trigger boreholes was brought forward.In addition, when the time delay errors of instantaneous detonators were controlled under several micro-seconds or even several tenths of one micro second, and the measuring instrument was introduced to measure the time delay error, the errors of seismic travel time information and geological predictions could be reduced. By means of the combined blasting method, seismic waves with the characteristic of both highenergy and high frequency, as well as long distance and better precision of predictions could be obtained at the same time. This method was successfully applied at the Yunwushan tunnel of the Yiwan Railway, and the Qiyueshan Tunnel and the Longtan tunnel of the Hu-Rongxi Expressway.

Keywords: combined blasting tunnel seismic prediction(TSP) seismic wave advanced geological prediction time delay error

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