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鄂西地应力测量与隧道岩爆预测分析

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摘要 国家重点工程宜昌—万州(以下简称宜万)铁路穿越鄂西灰岩山区, 形成了大量深埋隧道。为了对设计进行优化并指导施工, 在宜万铁路沿线进行了多个钻孔的水压致裂法地应力测量, 并通过地应力实测资料进行岩爆及塑性大变形分析预测。测试结果表明: 鄂西灰岩山区具有中等偏高应力水平, 最大水平主应力方向主要为近EW向。基于实测应力结果, 通过工程岩体分级标准判别法、Russenes判别法、Turchaninov判别法、Hoek判别法等4种判别方法进行预测, 埋深较深的坚硬岩石隧道有岩爆发生的可能, 而软岩隧道也有可能发生塑性大变形。在施工过程中应采取合理的开挖方式及防爆安全措施, 防止灾害发生。

关键词 [岩石力学](#) [水压致裂法](#) [岩爆](#) [大变形](#) [铁路隧道](#) [鄂西地区](#)

分类号

IN-SITU STRESS MEASUREMENT AND PREDICTION ANALYSIS OF TUNNEL ROCKBURST IN WEST HUBEI

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Abstract

The national key project, Yichang—Wanzhou Railway, passes through the limestone mountainous area in west Hubei; and many deep-seated tunnels are needed to construct. In order to optimize the design and guide construction, hydro-fracturing stress measurements have been conducted for many boreholes along Yichang—Wanzhou Railway tunnel line in west limestone mountainous area of Hubei Province. It can be concluded that the in-situ stress magnitude in this area is classified as middle to high level; and the direction of the maximal horizontal stress is near to East-West. Based on the in-situ stress results and four distinguish methods, which are engineering rock quality classification standard, Russenes method, Turchaninov method and Hoek method; rockbursts are predicted during tunnel construction in deep-seated and hard rock tunnel conditions; and large deformation are predicted during tunnel construction in deep-seated and soft rock tunnel condition. In order to avoid the disadvantage conditions, reasonable excavation method and safety precautions should be adopted during tunnel construction.

Key words [rock mechanics](#) [hydro-fracturing method](#) [rockburst](#) [large deformation](#) [railway tunnel](#) [west area of Hubei Province](#)

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