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# 乌鞘岭隧道F4断层区段监控量测综合分析

刘志春, 李文江, 孙明磊, 朱永全

(石家庄铁道学院 土木工程分院, 河北 石家庄 050043)

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**摘要** 乌鞘岭隧道是兰新线重点控制工程, 是国内最长的单线铁路隧道。该隧道穿越4条区域性大断层, 地质及地应力条件十分复杂, 围岩软弱破碎, 变形大。针对复杂应力条件下的软岩大变形隧道特点, 在F4断层区段施工过程中, 严格进行系统、全面、长期的监控量测指导设计施工, 以实测的拱顶下沉、水平收敛、锚杆轴力、初期支护围岩压力、初期支护钢架应力、初期支护混凝土应力、二次衬砌接触压力、二次衬砌混凝土应力数据为依托, 进行实测数据与施工工序的关系、围岩压力与位移的关系、量测项目稳定值的预测、多量测项目发展趋势相互关系规律、位移的纵向分布规律、荷载侧压力系数、二次衬砌分担围岩压力比例、二次衬砌施作时机等多项综合分析, 及时将处理信息反馈给施工, 对开挖后的结构稳定性作出分析判断及采取相应措施。实践证明效果可靠, 围岩稳定, 结构完好, 为保证该区段顺利贯通提供可靠的技术保证。

**关键词** [隧道工程](#) [乌鞘岭隧道](#) [监控量测](#) [围岩压力](#) [位移](#) [结构稳定性](#) [综合分析](#)

分类号

## MONITORING AND COMPREHENSIVE ANALYSIS IN F4 SECTION OF WUQIAOLING TUNNEL

LIU Zhichun, LI Wenjiang, SUN Minglei, ZHU Yongquan

(School of Civil Engineering, Shijiazhuang Railway Institute, Shijiazhuang, Hebei 050043, China)

### Abstract

Wuqiaoling tunnel, the longest single-track railway tunnel in China, is the key project of Lanzhou—Urumchi Railway. It goes through four regional faults, and its geological and geostress conditions are complicated. According to the characteristics of soft rock and large deformation under the complicated stress condition, the comprehensive monitoring is executed during the construction in F4 section. Based on the measured results of the vault settlement, the horizontal convergency, the axial force of rock bolt, the surrounding rock pressure, the steel liner plate stress, the concrete stress of preliminary support, the stress and pressure of the secondary lining, the synthetical factors of the relation between measurement and construction procedure, the relation between surrounding rock pressure and displacement, the forecast of measurement, the developmental rule of multi-measurement items, the longitudinal distribution rule of displacement, the coefficient of lateral pressure, the shared ratio of secondary lining, the time of secondary lining construction, etc. are analysed. And the information is fed back to the construction in time. The structure stability is analysed and the corresponding measures are adopted, which can provide references for data simulation and theoretical analysis. The practice proves that the effect is reliable, the surrounding rock is steady and the structure is in good condition, which can provide a reliable technology reference for the perforation of the section.

**Key words** [tunnelling engineering](#) [Wuqiaoling tunnel](#) [monitoring and measurement](#) [surrounding rock pressure](#) [displacement](#) [structures stability](#) [comprehensive analysis](#)

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