

# 位移向量方位趋势线在乌鞘岭隧道工程中的应用研究

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**摘要** 采用高精度全站仪配合反射膜片所组建的三维变形观测系统对乌鞘岭隧道F7断层和志留系板岩夹千枚岩地段的三维位移进行测试和分析, 并借鉴欧洲学者所发展的隧道三维变形展示方式来呈现隧道开挖地层的反应特性和变形特征。研究表明, 用相距开挖面约1.0倍洞径处或在1.0倍洞径内的位移向量方位趋势线, 可反映出一定区域岩体刚度的分布状况及变化趋势, 并预判隧道开挖地层中一定范围内软硬岩层的变化趋势或可能存在的不良地质结构。目前国内尚处于试验探索阶段, 宜将隧道开挖产生的位移信息与实际揭露出的围岩地质状况进行大量的对比分析与研究, 并可辅之以其他的超前地质预报手段, 以合理预测隧道前方的地质情况。

**关键词** [隧道工程](#); [隧道位移向量方位趋势线](#); [乌鞘岭隧道](#); [三维变形观测系统](#); [岩体刚度](#); [地质预测](#)

分类号

## STUDY ON APPLICATION OF DISPLACEMENT VECTOR ORIENTATION TREND LINE TO WUSHAOLING TUNNEL

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### Abstract

With the three-dimensional deformation survey system composed of the high accuracy lightwave electronic tachometer combined with reflecting film, the three-dimensional displacements at fault F7 and slate with sandwiched Phyllis section of Silurian have been tested and analyzed in Wushaoling tunnel. Meanwhile, the response characteristics and deformation character of excavated strata of tunnel are presented through three-dimensional

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deformation revelation that is developed by European scholars. Result shows that the displacement vector orientation trend line at the place, which is 1.0 time of the tunnel diameter or less from working face, can be used to reveal the distribution and change trend of rock mass stiffness at certain region, and it can predict the change trend of soft and hard rocks or unfavorable geological structure at excavated strata. At present time, it is still under its initialization for underground construction engineering, and the information related to displacement is analyzed, which is obtained by exaction with that of the practical geological condition of surrounding rock. With the help of other geological forecast facilities or methods, the geological conditions of the unexcavated ground around cavern can be properly predicted.

**Key words** [tunneling engineering](#); [trend line of tunnel displacement vector orientation](#); [Wushaoling tunnel](#); [three-dimensional deformation survey system](#); [rock mass stiffness](#); [geological prediction](#)

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