

工程与应用

公路隧道射流风机通风效果优化研究

于福华¹, 贺昱曜¹, 李国强²

1.长安大学 电子与控制工程学院, 西安 710064

2.中交第一公路勘察设计院有限公司 西安金路交通工程科技发展有限公司, 西安 710077

收稿日期 2008-10-6 修回日期 2008-12-25 网络版发布日期 2010-4-11 接受日期

摘要 以公路隧道射流风机通风效果为研究对象, 综合分析影响射流风机纵向通风效果的各项因素, 利用计算流体力学 (CFD) 理论, 对射流风机的安装高度、风机轴线与隧道轴线之间的夹角进行优化仿真分析。以1120型风机为例通过隧道三维建模技术Solidworks进行效果优化仿真, 得到最优安装高度及夹角, 达到了公路隧道射流风机通风效果的优化。仿真结果表明射流风机的安装高度与射流角度对通风效果的影响趋势呈抛物线特征, 存在一个最优的射流风机安装高度和风机轴线与隧道轴线的夹角, 为公路隧道通风设计提供了科学依据。

关键词 [公路隧道](#) [通风效果](#) [Solidworks技术](#) [系统仿真](#) [参数优化](#)

分类号 [U459.2](#)

Optimization on ventilation effect of jet fan in highway tunnel

YU Fu-hua¹, HE Yu-yao¹, LI Guo-qiang²

1.School of Electronic and Control Engineering, Chang'an University, Xi'an 710064, China

2.Xi'an Jinlu Communication Engineering and Technology Development CO.LTD., The First Highway Survey and Design Institute of China CO.LTD., Xi'an 710077, China

Abstract

The ventilation effect of jet fan is the study object of this paper. After comprehensive analysis of various factors on ventilation jet fan vertical effects, the important influence about the height of jet fan and the angle between the jet fan axes and the tunnel axes for the ventilation effect is optimized based on the Computational Fluid Dynamics (CFD) theory. Fan 1120 as an example to simulate the optimize results, gets the optimal installation height and angle degree by Three-dimensional modeling tunnel solidworks, reaching a highway tunnel ventilation fan jet effect of optimization. The simulation result shows there are an optimal installation of the jet fan and a high degree of fan axis with the tunnel axis angle, which are decided by the parabola characteristics appearing the influence trend. The Simulation result provides the scientific basis to the highway tunnel ventilation design.

Key words [highway tunnel](#) [ventilation effect](#) [Solidworks](#) [system simulation](#) [parameter optimization](#)

DOI: 10.3778/j.issn.1002-8331.2010.11.065

通讯作者 于福华 yufh@qq.com

扩展功能

本文信息

▶ [Supporting info](#)

▶ [PDF\(736KB\)](#)

▶ [HTML全文\(0KB\)](#)

▶ [参考文献](#)

服务与反馈

▶ [把本文推荐给朋友](#)

▶ [加入我的书架](#)

▶ [加入引用管理器](#)

▶ [复制索引](#)

▶ [Email Alert](#)

▶ [文章反馈](#)

▶ [浏览反馈信息](#)

相关信息

▶ [本刊中 包含“公路隧道”的相关文章](#)

▶ [本文作者相关文章](#)

· [于福华](#)

· [贺昱曜](#)

· [李国强](#)