

不平路面激励对挂车车辆纵向平顺性影响的时域模型仿真分析及试验研究

Simulation Analysis & Experimental Study on the Mathematical Model in Time Domain About the Effects of the Road Stimulation on the Longitudinal Smoothness of Tractor-trailer Combination

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英文关键词: tractor trailer combination; random footprint tire model; road stimulation; longitudinal smoothness; computer simulation in time domain

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作者	单位
高举成	吉林工业大学
郑联珠	吉林工业大学
刘明树	吉林工业大学

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中文摘要:

为了考察不平路面激励对挂车车辆纵向平顺性的影响, 构造了一种能同时反映不平路面对车辆的垂直与纵向激励状况的随机接地印迹轮胎模型, 建立了其相应的车辆动力学模型, 并在确定性函数路面激励状况下对该模型进行了时域仿真, 分析了其对挂车车辆牵引架动态纵向力的影响。仿真分析结果与试验结果相吻合。

英文摘要:

A new random footprint tire model was developed, which can reflect both the vertical and the horizontal stimulation at the same time. It was used to review the tractor trailer combination longitudinal smoothness. A corresponding dynamic vehicle model was established. The computer simulation to the vehicle model in time domain about the determined function of road stimulation was carried out. The effects on the towing attachment longitudinal dynamic forces of the tractor trailer combination were analyzed. Experimental study with two different towing attachments, i.e. rigid towing attachment and pliable towing attachment was performed. A comparison of the results obtained by the simulation with available experimental data shows very good agreement.

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服务热线: 010-65929451 传真: 010-65929451 邮编: 100026 Email: tcsae@tcsae.org

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