

基于修正Craig-Bampton方法的轮胎动态子结构模型 Dynamic Substructure Tire Model Based on Modified Craig-Bampton Method

张晓阳 孙蓓蓓 陈南 孙庆鸿

东南大学

关键词: 轮胎 整车动力学模型 有限元法 试验模态法 模态综合

摘要: 以轮胎模态试验获取的模态参数和参数化轮胎有限元模型为基础, 通过优化方法使有限元模型的计算模态参数与试验模态参数一致, 获得动力学等效的轮胎模型, 将该模型视作连接车辆与地面的子结构, 基于修正的Craig-Bampton方法和轮胎接地界面特性, 得到轮胎子结构的主模态集和约束模态集, 使用模态综合方法实现轮胎子结构模型与车辆多体动力学模型的耦合, 此模型可广泛应用于车辆平顺性仿真和整车动态优化设计。 An approach to modeling parameterized FEM tire based on experimental modal parameters was proposed. Natural frequencies, mode shapes and damping ratios of FEM tire model with the optimal parameters had good agreement with modes acquired by the experiment. With Craig-Bampton method and tire-ground contact characteristic obtained from tire static radial compression experiment, normal and constraint modes of FEM tire model were extracted for building dynamic substructure model of tire. The coupling of tire substructure model and vehicle multi-body model was realized through modal synthesis, which can contribute to vehicle dynamic simulation and optimization design.

[查看全文 \(请使用Adobe Acrobat 6.0版本浏览\)](#) [返回首页](#) [引用本文](#)