

简报

随机不平顺激励下磁浮车辆轨道梁动力响应

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摘要 建立了高速常导磁浮交通车辆轨道梁空间耦合模型, 探讨了合理的磁浮线路功率谱形式, 利用分离迭代的数值积分方法求解了大规模非线性耦合动力方程. 利用计算结果分析了随机不平顺对系统动力学指标影响规律, 并采用功率谱密度曲线进行了谱分析, 得到了高速磁浮交通车梁耦合系统随机振动的基本规律.

关键词 [铁路运输](#) [磁悬浮](#) [耦合动力学](#) [线路不平顺](#) [轨道梁](#)

分类号 [U237](#), [U266](#)

Study on dynamic responses of high-speed maglev vehicle/guideway coupling system under random irregularity

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Abstract

In this paper, the maglev vehicle/guideway dynamic model is established based on the EMS maglev vehicle and the elevated-guideway technology, the PSD model for guideway irregularities is discussed, and the separated iterative procedure and its corresponding numerical algorithm are applied in simulations. The effect of random irregularity on dynamic characteristics of the maglev system is studied numerically, and the random responses of the vehicle and the guideway are analyzed. Finally the random vibration characteristics of the vehicle/guideway system are obtained. It is on this basis that control suggestions are proposed for guideway irregularity in maglev.

Key words [railway transport](#) [maglev](#) [coupling dynamics](#) [guideway irregularity](#) [guideway](#)

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