

**A Numerical Simulation Method for Ground and Building Vibration Based  
on Three Dimensional Dynamic Analysis**

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Numerical simulation is an effective tool for investigating the properties of the source and propagation of train induced vibration. However, the analysis of the whole model of train-induced vibration, which consists of the moving train, the track, the supporting infrastructure, the ground, and the building, is currently too large to solve. We thus proposed a numerical simulation method by combining two separate dynamic analysis models. One is an analysis model of the dynamic interaction between the moving train and the track-structure system for calculating excitation force. The other is a three dimensional dynamic analysis model of the supporting structure, the ground, and the building for calculating the propagation of vibration.