Abstract

Transient Response of Bridges Traversed by Moving Vehicles: Pitch-Bounced Model

Leila Bahreinian

Master of Applied Science

Graduate Department of Mechanical and Industrial Engineering

University of Toronto

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This thesis presents a finite element discretization problem to obtain the transient response of an elastic bridge modeled as a slender beam with various boundary conditions traversed by different types of moving vehicle models. The Newmark β time integration method is used to integrate the discretized equations of motion. The whole approach is coded in MATLAB. The illustration results show good agreement with the ones reported in the literature. First the program is used to solve four vehicle models. Then a new model for vehicles is developed and the equations of motions are found and solved by the presented approach. The results of the new model are more practical than the other models.