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Tutorial Review

Moving-load dynamic problems: A tutorial (with a brief overview)

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Abstract

This tutorial is dedicated to the study of structural dynamics problems caused by moving loads. Through a simple example of a simply supported beam traversed by a moving mass, several fundamental concepts peculiar to moving-load problems are introduced. The necessary mathematics involved is presented. The analytical procedure is also presented for a circular plate excited by a rotating oscillator. Then numerical results of a circular beam spinning about its longitudinal axis excited by an axially moving surface load are provided. A variety of moving-load problems are briefly reviewed with some published papers and books to help readers quickly get into problems of their interests. Readers are expected to get a flavour of what moving-load problems are about, what general methods are available and what research has been done from studying this tutorial. Knowledge of partial differential equations and vibration theory of beams and plates is required in order to understand this tutorial.



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Keywords

Moving load; Vibration; Control; Nonstationary; Contact; Friction

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