عنوان مقاله:

3D Exact Solution to Moving Load of a Thick Rectangular Plate

محل انتشار:

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خلاصه مقاله:

Dynamic behavior of continuous systems such as beam and plate, under moving loads is a significant engineering subject. In this paper, 3D elasticity equations are solved by use of the displacement potential functions, and the exact solution of a simply supported thick rectangular plates under moving load is presented. For this purpose, the governing equations in terms of displacements, Navier's equations, using displacement potential functions are converted to two linear partial differential equations of forth and second order. Then the governing equations in terms of the potential functions are solved using the separation of variables and Laplace integral transform, satisfying exact initial and boundary conditions. In order to validate, the obtained results of this study are compared with the results of the classical theory of plates for thin and existing solutions for moderately thick plates. It is observed that the speed of a moving load has very effective on the plate dynamic response.

کلمات کلیدی:

Thick rectangular plates, moving load, simply supported, potential functions

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