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# Three-dimensional thermo-elastic analysis and dynamic response of a multi-directional functionally graded skew plate on elastic foundation

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## Abstract

Three-dimensional thermo-elastic analysis of a multi-directional functionally graded skew plate on elastic foundation under thermo-mechanical loading is carried out for the first time. Numerical results of displacement and stresses are obtained using differential quadrature method (DQM). Some material properties of the plate assumed to be temperature-dependent and graded in all three spatial directions according to a power law function. The results for various boundary conditions are obtained and the effects of grading index of material properties, temperature distribution, elastic foundation parameters and angle of skew plate are presented. Moreover, the dynamic response of a multi-directional functionally graded material skew plate on elastic foundation is obtained using 4D DQM for the first time. The results show that the material grading direction has a noticeable effect on plate behavior especially for the plates under thermal loading as well as for the dynamic response of the plate.

## Keywords

Skew plate; differential quadrature method; three-dimensional thermo-elasticity; multi-directional functionally graded materials.

## 1. Introduction

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