Accepted Manuscript

Vibrational characteristics of embedded microbeams lying on a two-parameter elastic foundation in thermal environment

Bekir Akgöz, Ömer Civalek

PII: S1359-8368(18)30945-4

DOI: 10.1016/j.compositesb.2018.05.049

Reference: JCOMB 5719

To appear in: *Composites Part B*

Received Date: 23 March 2018

Revised Date: 24 May 2018

Accepted Date: 29 May 2018

Please cite this article as: Akgöz B, Civalek Ö, Vibrational characteristics of embedded microbeams lying on a two-parameter elastic foundation in thermal environment, *Composites Part B* (2018), doi: 10.1016/j.compositesb.2018.05.049.

Vibrational characteristics of embedded microbeams lying on a two-parameter elastic foundation in thermal environment

Bekir Akgöz[a,1] and Ömer Civalek[a]

[a]Akdeniz University, Civil Engineering Department,
Division of Mechanics, Antalya-TURKEY

Abstract

In the present work, thermo-elastic vibrational behavior of thick microbeams embedded in a two-parameter elastic foundation is studied. A Winkler-Pasternak type elastic foundation model is employed to simulate the interactions between microbeam and elastic medium. Size-dependent constitutive equations and associated boundary conditions are obtained by applying dynamic version of virtual work's principle based on modified couple stress and various beam theories. Several numerical examples are presented to examine the sensibility of various parameters associated with slenderness ratio, temperature rise, length scale, Winkler and shear layer parameters on the natural frequencies and critical temperature point of embedded microbeams.

Keywords: B. Microstructures; B. Thermomechanical; B. Vibration; C. Analytical modelling

[1]Corresponding author: Tel: +90-242-3106360; Fax: +90-242-3106306

E-mail address: bekirakgoz@akdeniz.edu.tr