

Vibrations of rigidly fixed elastic cylinder with double porosity

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ABSTRACT

This paper presents a comprehensive investigation into the vibrational analysis of rigidly fixed elastic cylinder with double porosity. The mathematical model is employed to investigate the vibration analysis of a homogeneous isotropic elastic cylinder with double porosity, subjected to rigidly fixed boundary conditions. To achieve this, a time harmonic variation technique is utilized, converting the governing partial differential equations into a system of ordinary differential equations. The frequency equations have been obtained by considering fixed boundary conditions. To observe the free vibrations, numerical iteration methods has been implemented with the aid of MATLAB software to analyze the frequency equation. Graphical representations of the frequency shift and natural frequencies with respect to mode number are presented by utilizing computer-simulated numerical results derived from analytical solutions.

Keywords: Elastic cylinder; Voids volume fraction; double porosity; frequency shift; natural frequencies.

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