FLEXURAL VIBRATIONS OF FINITE COMPOSITE POROELASTIC CYLINDERS

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ABSTRACT: This study deals with the flexural vibrations of composite poroelastic cylinder consisting of two cylinders made of different materials that are bonded end to end. The frequency equations each for pervious and impervious surfaces are obtained in the frame work of Biot's theory of wave propagation in poroelastic solids. If wave length is infinite, both the frequency equations are degenerated as product of two determinants pertaining to extensional vibrations and shear vibrations, respectively. In this case, it is seen that nature of surface does not have any influence over shear vibrations. For illustration purpose, three composite cylinders are considered and then discussed. Of three composite cylinders, two are sandstone cylinders and the third one is resulted when a cylindrical bone is implanted with Titanium. In either case, phase velocity is computed against aspect ratio.