

AN ABSTRACT OF A THESIS

**EFFECT OF BOUNDARY CONDITIONS ON THE FREE VIBRATION
OF FINITE LENGTH HOLLOW CIRCULAR CYLINDERS**

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A nine-node Lagrangian finite element was formulated in a cylindrical coordinate system to analyze the free vibration of finite length hollow circular cylinders. The governing three-dimensional dynamic elasticity equations were solved assuming periodic motion in time. A study of boundary condition effects on the free vibration of hollow cylinders was the primary topic of study. Free, fixed, and five different types of simple support boundary conditions were analyzed. Numerical results for frequency and mode shape were presented in tabular form and graphical plots. Vibration frequencies for isotropic solid and hollow circular cylinders with free-free boundary condition and Poisson's ratio of $\nu=0.3$ were compared with similar results in the existing literature to verify the computer code.