

A CONVEXITY PROPERTY OF INHOMOGENEOUS INCOMPRESSIBLE ELASTIC CYLINDERS

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ABSTRACT

This note draws attention to an interesting convexity property of incompressible, inhomogeneous isotropic linear elastic cylinders. Considering a right cylinder of general cross-section of this type, whose shear modulus is a smooth function of the cross-sectional coordinates, subject to a class of displacement boundary conditions on its lateral boundary, it is found that a non-negative cross-sectional measure of deformation is a convex function of the axial coordinate provided that the shear modulus is a convex function of the cross-sectional coordinates. Some implications are discussed.