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ASYMPTOTIC BEHAVIOR OF THE SOLUTION OF AN AXISYMMETRIC PROBLEM OF ELASTICITY THEORY FOR A RADIALLY-INHOMOGENEOUS TRANSVERSALLY-ISOTROPIC CYLINDER OF SMALL THICKNESS

Abstract

An axisymmetric problem of elasticity theory is studied by the method of asymptotic integration of equations of elasticity theory [1] for a radially-inhomogeneous transversally-isotropic cylinder of small thickness when mixed boundary conditions are given on lateral surfaces.

Inhomogeneous and homogeneous solutions are constructed. It is shown that when lateral surfaces are simply supported, some penetrating solution corresponds to the first asymptotic process. The stressed state determined by this solution is equivalent to the principal vector of forces applied on arbitrary section $\xi = const$. It is obtained that deflected mode in the cylinder is composed of penetrating deflected mode and edge effect similar to Saint-Venant'l edge effect in the theory of transversally-isotropic inhomogeneous plates.