

ASYMPTOTIC BEHAVIOR OF THE SOLUTION OF
A TORSION PROBLEM OF A TRANSVERSALLY
-ISORTOPIC CYLINDRICAL SHELL WITH
VARIABLE SHEAR MODULUS

Abstract

In the paper, we study a torsion problem of a transversally –isotropic hollow cylinder when the lateral surfaces are free from stresses, and the elastic characteristics vary according to general power laws on radius. Exact and asymptotic solutions of the torsion problem are constructed. The exact asymptotic expansions of homogeneous solutions are obtained and the stress –strain state of the cylinder is analyzed. It is shown that the solution is composed of two types of solutions: the penetrating solution and the boundary layer type solution. In the case of considerable anisotropy, some boundary layer solutions don't damp and may penetrate rather deep and essentially change the picture of the stress- strain state far from the cylinder endfaces.