

# Specific characteristics of numerical determination of the boundary effect stress-strain state for an orthotropic strip

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## Abstract

© 2016, Allerton Press, Inc. The paper deals with the problem of determining the stress-strain state near the boundary of a one-layer strip made of an orthotropic material subjected to a self-balanced load applied at the end of the strip (Saint-Venant effect, boundary effect, and boundary layer). A comparative analysis of two methods for determining the boundary effect is carried out. The first method, i.e., the solution in stresses (with respect to  $\sigma_y$ ), was developed by L. A. Agalovyan and gives good results of one-layer strips. The second approach, i.e., the solution in displacements, was developed by the author, and its results for the one-layer strip practically coincides with the solution in stresses. The obtained results were also verified by FEM. But the solution of the problem of elasticity in displacements is much more promising when analyzing multilayer strips.

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## Keywords

boundary effect, characteristic equation, collocation method, complex roots, homogeneous solution, numerical realization, orthotropy