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Implementation of the method of fundamental solutions for solving a torsion problem of functionally graded orthotropic bar

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This paper concerns a torsion problem of functionally graded orthotropic bar. The functionally graded material is an inhomogeneous material, characterized by continuously change of its properties at least in one direction. In such case the elastic moduli are varied and they are modeled as the functions of coordinates. The considered problem is described by partial differential equation of second order with the variable coefficients and the boundary conditions. An algorithm based on the method of fundamental solutions is proposed to solve a formulated problem. Considering the character of governing equation the method of fundamental solutions is supported by interpolation by radial basis functions and Picard iterations. To check accuracy and convergence of the proposed method the numerical experiment has been performed.

Keywords: Functionally graded materials, Orthotropic body, Torsion of prismatic bars, Method of Fundamental Solutions, Radial basis functions