A Semi-Analytical Method for Analysis of the Axially Symmetric Problem on Indentation of a Hot Circular Punch into an Arbitrarily Nonhomogeneous Halfspace

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Abstract : An approximate analytical-numerical solution to the axisymmetric problem on thermo-mechanical indentation of a flat cylindrical punch into an arbitrarily non-homogeneous elastic half-space is constructed by making use of the bilateral asymptotic method. The key point of this method lies in evaluation of the ker¬nels in the obtained integral equations by making use of a numerical technique. Once the structure of the kernel is defined, it then is approximated by an analytical expression of special kind so that the solution of the integral equation can be achieved analytically. This fact allows for construction of the solution in an analytical form, which is convenient for analysis of the mechanical effects concerned with arbitrarily presumed non-homogeneity of the material.

Keywords : contact problem, circular punch, arbitrarily-nonhomogeneous halfspace

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