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Transient Heat Conduction in Nonuniform Hollow Cylinders with Time Dependent Boundary Condition at One Surface

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Abstract : A solution methodology without using integral transformation is proposed to develop analytical solutions for transient heat conduction in nonuniform hollow cylinders with time-dependent boundary condition at the outer surface. It is shown that if the thermal conductivity and the specific heat of the medium are in arbitrary polynomial function forms, the closed solutions of the system can be developed. The influence of physical properties on the temperature distribution of the system is studied. A numerical example is given to illustrate the efficiency and the accuracy of the solution methodology.

Keywords : analytical solution, nonuniform hollow cylinder, time-dependent boundary condition, transient heat conduction
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