TRANSIENT THERMOELASTIC PROBLEM FOR SOLID SPHERE WITH THERMAL ENERGY

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Abstract

As we know, thermal behavior of structures must be considered in many situation such as study of thermal effect on thermal strains, stresses, deformation and inverse heat conduction problem. There is a practical requirement of solid sphere in various modern project. In this task, we endeavour to solve the heat conduction equation by applying time depending heat flux to solid sphere of radius 'a' which is free from traction. The initial temperature of the sphere is same as that of surrounding temperature, which is zero. The sphere is subjected to transient heat supply, angular symmetric i.e. along radial direction, on the curved surface. In this article, an attempt is being made to solve heat conduction equation by applying the integral transform and it's inverse. The result is obtained in a series form of Bessel function. The result is illustrated numerically and graphically. The obtained result may be useful in solving engineering problem, particularly for industrial machines subjected to heating and cooling.