

Dynamic Response of Nano Spherical Shell Subjected to Thermo-Mechanical Shock Using Nonlocal Elasticity Theory

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Abstract : In this paper, we present an analytical method for analysis of nano-scale spherical shell subjected to thermo-mechanical shocks based on nonlocal elasticity theory. Thermo-mechanical properties of nano sphere is assumed to be temperature dependent. Governing partial differential equation of motion is solved analytically by using Laplace transform for time domain and power series for spacial domain. The results in Laplace domain is transferred to time domain by employing the fast inverse Laplace transform (FLIT) method. Accuracy of present approach is assessed by comparing the numerical results with the results of published work in literature. Furthermore, the effects of non-local parameter and wall thickness on the dynamic characteristics of the nano-sphere are studied.

Keywords : nano-scale spherical shell, nonlocal elasticity theory, thermomechanical shock, dynamic response

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