عنوان مقاله:

INVESTIGATION OF SOLID ARGON FILM WITH TEMPERATURE-DEPENDENT PROPERTIES UNDER THE FRAMEWORK OF HIGHLY NON-LINEAR DUAL-PHASE-LAG MODEL IN A NANOSCALE GEOMETRY

محل انتشار:

کنفرانس ملی مهندسی مکانیک ایران (سال: 1392)

تعداد صفحات اصل مقاله: 12

نویسندگان:

zahra shomali - *Department of Physics, Institute for Advanced Studies in Basic Sciences (IASBS), P.O. Box ۴۵۱۹۵-۱۱۵۹, Zanjan, Iran*

jafar ghazanfarian - *Department of Mechanical Engineering, University of Zanjan, University Blvd., ۴۵۳۷۱-۳۸۷۹۱ Zanjan,Iran*

abbas abbassi - *Mechanical Engineering Department, Amirkabir University of Technology, ۴۲۴ Hafez Avenue, P.O. Box ۱۵۸۷۵-۴۴۱۳, Tehran, Iran*

خلاصه مقاله:

The one-dimensional non-linear non-Fourier heat conduction within a thin film of solid argon is numerically investigated under the framework of the Dual-Phase-Lagging (DPL) model with the boundary phonon scattering. Considering temperature-dependent thermal properties for solid argon, the results are compared with those obtained from the Molecular-Dynamics simulation for the case of constant applied temperature at the left boundary. The case is studied under condition of constant volumetric heat capacity. It is concluded that the combination of the DPL model with the mixed-type temperature boundary condition is able to accurately predict the heat flux and temperature distribution obtained from the molecular dynamics simulation. It is also found that using the temperature jump boundary condition along with the DPL model is essential to precisely capture the nano-scale heat transport

کلمات کلیدی:

DPL model, solid argon, non-linear behavior, temperature-dependent properties

لینک ثابت مقاله در پایگاه سیویلیکا: