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Development of a Lattice Boltzmann based Nanoscale Heat Transfer Model and Its Application to Electronics and Data Storage Industry

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Abstract

The goal of the proposed work is to construct advanced simulation tools for nanoscale heat transfer in solids based on fundamental scientific principles. Nanoscale heat transfer in solids has become an important topic. With the reduction of size of numerous devices, especially electronics and MEMS, to the nanoscale domain, the conventional energy transport modeling becomes inaccurate due to its phenomenological formation. This makes it an imperative to develop an accurate model, which contains the correct physics of the energy carriers and the interaction among themselves, as the system size approaches subcontinuum regime.