

Numerical Investigation of Heat Transfer in Laser Irradiated Biological Samplebased on Dual-Phase-Lag Heat Conduction Model Using Lattice Boltzmann Method

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Abstract : Present work is concerned with the numerical investigation of thermal response of biological tissues during laser-based photo-thermal therapy for destroying cancerous/abnormal cells with minimal damage to the surrounding normal cells. Light propagation through the biological sample is mathematically modelled by transient radiative transfer equation. In the present work, application of the Lattice Boltzmann Method is extended to analyze transport of short-pulse radiation in a participating medium. In order to determine the two-dimensional temperature distribution inside the tissue medium, the RTE has been coupled with Penne's bio-heat transfer equation based on Fourier's law by several researchers in last few years.

Keywords : lattice Boltzmann method, transient radiation transfer equation, dual phase lag model

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