

Abstract Submitted  
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**A hybrid continuum-atomistic simulation of heat transfer in micro flow** JIN LIU, SHIYI CHEN, Department of Mechanical Engineering, The Johns Hopkins University, XIAOBO NIE, MARK ROBBINS, Department of Physics and Astronomy, The Johns Hopkins University — The heat transfer problem in a micro/nano flow is studied based on domain decomposition hybrid method. This method uses an atomistic description in one part of the domain and a continuum description in other place. Two solutions are matched in a coupling region which is necessary to ensure their consistency including the temperature and heat flux. In the coupling region, the statistical results from the atomistic simulation provides the boundary conditions for continuum energy equation, and the particle velocities are rescaled to account for the energy transfer from continuum domain to to particle domain. Simulation results for steady and unsteady heat transfer in a channel flow will be shown. The effect of rough wall on the heat transfer will also be discussed.

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