Heat transfer at nanoscale and boundary conditions

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We consider models of nonlocal heat transfer at nanoscale in rigid body, being the analysis of the heat transport in nano-systems a very important task from the practical point of view with an interesting theoretical appeal. Precisely, by considering the heat flux as the result of a regular motion of the phonons, we focus on the role played by the phonon-boundary scatterings and on their correct mathematical modelling. Suitable boundary conditions are analyzed, and the consequent forms of the basic fields have been obtained. The well-posedness of the problem is also investigated.