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Radiative heat transfer in low-dimensional systems – microscopic mode[1] LILIA WOODS, ANH PHAN, DAVID DROSDOFF, Department of Physics, University of South Florida, Tampa, Florida 33620, USA — Radiative heat transfer between objects can increase dramatically at sub-wavelength scales. Exploring ways to modulate such transport between nano-systems is a key issue from fundamental and applied points of view. We advance the theoretical understanding of radiative heat transfer between nano-objects by introducing a microscopic model, which takes into account the individual atoms and their atomic polarizabilities. This approach is especially useful to investigate nano-objects with various geometries and give a detailed description of the heat transfer distribution. We employ this model to study the heat exchange in graphene nanoribbon/substrate systems. Our results for the distance separations, substrates, and presence of extended or localized defects enable making predictions for tailoring the radiative heat transfer at the nanoscale.

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