

NONCONTACT RADIATIVE THERMAL MODULATION BETWEEN NANOPARTICLES

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ABSTRACT. We numerically demonstrate noncontact radiative thermal modulation between two silicon carbide (SiC) nanoparticles by rotating an intermediate graphene disk. It is shown that, when the graphene disk is in the middle of two terminal SiC nanoparticles, rotating the intermediate graphene disk can weaken the heat transfer to a large extent. In particular, when the chemical potential and radius of graphene disk are 0.8 eV and 90 nm, a near-field thermal switch can be realized. When the graphene disk moves away from two particles, rotating the intermediate graphene disk can enhance the heat transfer. Results obtained facilitate to modulate (suppress and amplify) the heat transfer in a many-body system consisting of nano-objects.