

## **NEAR-FIELD RADIATIVE HEAT TRANSFER IN A CHAIN OF NANOPARTICLES WITH ANOTHER CHAIN IN PROXIMITY**

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**ABSTRACT.** Many-body interaction has complex effect on near-field radiative heat transfer (NFRHT) in particulate system, which can both enhance or inhibit heat transfer. This work studies the NFRHT in a chain of particles (main chain) with another chain in proximity (proximate chain). The effect of the position of the proximate chain relative to the main chain, the component material of chains and the distance ( $d$ ) between the main and proximate chains on the thermal conductance are analyzed based on the many-body radiative heat transfer theory. The results show that the Ag proximate chain has little effect on the thermal conductance in both the Ag and the SiC main chains, while the SiC proximate chain will significantly inhibit the thermal conductance in both the SiC and the Ag main chains. The degree of inhibition of the SiC proximate chain on heat transfer along the SiC main chain is much heavier than that along the Ag main chain. In general, the existence of a proximate chain in the near field will have non-negligible effect on the heat transfer in the main chain due to many-body interaction. This work will help the understanding of the effect of many-body interaction on NFRHT in particulate system.