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Interfacial Thermal Transport Between Single Wall Carbon Nanotubes[1] JENNIFER LUKES, HONGLIANG ZHONG, University of Pennsylvania — Due to their superior thermal conductivity, single wall carbon nanotubes have elicited great interest as potential thermal management materials, for example as fillers in polymer composites and as thermal interface materials. Recent measurements on carbon nanotube composites have revealed lower-than-expected conductivities, and thermal interfacial resistance between the nanotubes and the surrounding medium has been implicated as a key factor limiting heat flow. However, one factor that has been little-considered is the role of interfacial thermal resistance between individual nanotubes. In these composites, the nanotubes form an interconnected network and for this reason interfacial resistance at the contact points between the nanotubes is also expected to have a significant effect on thermal energy transport. Our recent modeling results indicate that a four order of magnitude reduction in nanotube-nanotube interfacial resistance is obtained as the nanotubes are brought into intimate contact. These results will be discussed in this presentation.

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