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Phonon transmission in nanostructures

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Abstract

The governing mechanisms at play in todays nanostructured systems are related to phonon scattering at interfaces as for instance in layered systems or in nano-object composites. Actual theoretical models however disagree with Kapitza resistance measurements by several orders of magnitude and very few data have been reported to define heat flux at a single nanocontact.
We will propose a new approach to the estimation of the interfacial contact resistance based on atomic scale simulations, which have been applied in several configurations such as carbon based thermal interface materials.

Bio

Dr Sebastian Volz obtained his MSc. In Mechanical Engineering (French Grande Ecole ENSMA, France) and his Ph.D. in Mechanical Engineering (U. Poitiers, France) in the field of Nanoscale Thermal Physics. He was a postdoctoral research assistant at UCLA and held tenured positions as Assistant Professor in Heat Transfer (ENSMA) and as CNRS Research Fellow at Ecole Centrale Paris (France); 2009-2010 he was a Senior Research Fellow at the University of Tokyo. Since, he is a CNRS Senior Research Fellow at Ecole Centrale Paris where he leads the Thermal Nanosciences group. He carries out research in solid state nanoscale thermal transport, including phonon-electron-photon modelling and metrologies for key applications such as thermoelectricity and IC cooling. He is authoring more than 250 scientific communications and has edited two books. He has been leading the CNRS European Network ‘Thermal Nanosciences and Nanoengineering’ for ten years and the joint team between Ecole Centrale Paris and Thales Research and Technology for five years.

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