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Phonon Surface Scattering in Monte Carlo Simulations LEON MAURER, ZLATAN AKSAMIJA, University of Wisconsin-Madison, EDWIN RAMAYYA, Intel Corporation, AMIRHOSSEIN DAVOODY, IRENA KNEZEVIC, University of Wisconsin-Madison — Surface roughness has a significant impact on the thermal conductivity and thermoelectric properties of nanowires. We investigate the effect of surface roughness on thermal transport using a phonon Monte Carlo simulation. In addition to allowing us to simulate a wide range of wire dimensions and surface topographies, Monte Carlo enables us to investigate different models for surface scattering: constant specularity parameters, momentum-dependent specularity parameters, and specular scattering from randomly generated rough surfaces. We investigate the relative merits of different surface scattering models and the limitations on their validity.

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