

Alan McGaughey  
Associate Professor  
Department of Mechanical Engineering  
Carnegie Mellon University  
Pittsburgh, PA 15213-3890  
Tel: (412) 268-9605  
Fax: (412) 268-3348  
Email: mcgaughey@cmu.edu

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Dear *Physical Review B* Editor:

We are submitting the manuscript titled “Thermal Conductivity Accumulation in Amorphous Materials” by Jason M. Larkin and Alan J. H. McGaughey for consideration for publication in *Physical Review B*.

The objective of our work is to quantify and characterize the propagating and non-propagating contributions to thermal conductivity for a-SiO2 and a-Si to compare with recent experimental measurements by Regner at al. Two of the most widely-studied amorphous materials, a-SiO$\_2$ and a-Si, are examined in parallel to understand the experimental results.

By predicting the non-propagating contribution to thermal conductivity, we find good agreement by comparing with various experimental measurements for both a-SiO2 and a-Si, and in particular, to the measurements of Regner et al.

To calculate the propagating contribution, we predict the low-frequency scaling of the mode lifetimes, which are then use to predict the mean free paths. This scaling of the low-frequency lifetimes is still under debate in the literature, with both omega^{-2} and omega^{-4} scalings being used to explain differing experimental measurements. An omega^{-4} scaling has been suggested by various estimates based on experimental measurements, but has never been confirmed by an atomistic model.

We demonstrate, using the largest model of bulk a-Si that we are aware of, that the low-frequency mode lifetimes (and hence, mean free paths) follow an omega^{-2} scaling. By comparing to our model's predictions, we demonstrate that a faster than omega^{-4} scaling is necessary to explain the steep accumulations observed in the measurements of Regner et al. Further experimentation is suggested based on this comparison.

We suggest the following reviewers:

Davide Donadio  
Group Leader  
Max Planck Institute for Polymer Research  
donadio@mpip-mainz.mpg.de

Chris Dames

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We look forward to your response.

Sincerely,

A description...

Alan McGaughey