Abstract Submitted
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**Asymptotic analysis of the Boltzmann-BGK equation for oscillatory gas flows with application to thermal creep**[1] JASON NASSIOS, JOHN SADER[2], The University of Melbourne, Department of Mathematics and Statistics — Kinetic theory provides a rigorous foundation for calculating the dynamics of gas flow at arbitrary degrees of rarefaction. Solutions to the Boltzmann equation require numerical methods in many cases of practical interest. However, the near-continuum regime has been analyzed analytically using asymptotic techniques. These asymptotic analyses often assume steady flow, for which analytical slip models have been derived. Recent developments in nanofabrication have stimulated research into the study of oscillatory flows, drawing into question the applicability of the steady flow assumption. In this talk, I will discuss some key findings of a formal asymptotic analysis of the unsteady linearized Boltzmann-BGK equation, which generalizes existing theory to the unsteady case. The near-continuum limit is considered where the mean free path and oscillation frequency are small. A brief exploration of the implications of this theory for the oscillatory thermal creep problem will be presented, where temperature gradients along adjacent walls generate a flow.

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