

Abstract Submitted
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Numerical study of oscillatory Couette flow in rarefied gas YING WAN YAP, JOHN SADER¹, Department of Mathematics and Statistics, The University of Melbourne, Victoria 3010, Australia, YONG SHI, School of Power Engineering, Chongqing University, Chongqing 400030, People's Republic of China — Gas flows generated by nanoscale devices can achieve oscillation frequencies comparable to the intermolecular collision frequency. Modeling these flows often requires the use of kinetic theory, because such operation invalidates the use of standard continuum treatments. The Bhatnagar-Gross-Krook (BGK) kinetic model approximates the effect of molecular collisions as a relaxation process, and is often used to describe non-equilibrium gas flows. In this talk, I will present a numerical study of oscillatory Couette flow to obtain benchmark solutions using the BGK model. Applicability of the lattice Boltzmann method to such flow is also assessed using these benchmark solutions.

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