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Dynamics and effective temperature for a steady-state sheared glass[1] THOMAS HAXTON, ANDREA LIU, University of Pennsylvania Department of Physics and Astronomy — In a model sheared glass, the slow dynamics near the onset of jamming are shown to be controlled by a well-defined effective temperature $T_{\rm eff}$. We conduct two-dimensional nonequilibrium molecular dynamics simulations of steadily-sheared, densely-packed, bidisperse disks with soft repulsive pairwise interactions in contact with a heat reservoir. We calculate the viscosity and $T_{\rm eff}$ as functions of shear rate $\dot{\gamma}$ and bath temperature $T_{\rm bath}$. At $\dot{\gamma} = 0$, the system undergoes a glass transition at $T_{\rm bath} = T_g$. We study the steady state at $\dot{\gamma} \neq 0$ and $T_{\rm bath} < T_g$. At low $\dot{\gamma}$, $T_{\rm eff}$ decreases extremely slowly with $\dot{\gamma}$ and is nearly independent of $T_{\rm bath}$, while the viscosity continues to increase rapidly. The dramatic change in dynamics with a gradual change in effective temperature is reminiscent of the behavior of the quiescent system as temperature is lowered towards T_g.

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