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Hydrodynamic Correlation Functions of a Driven Granular Fluid in Steady State KATHARINA VOLLMAYR-LEE, Bucknell University, USA, TIMO ASPELMEIER, ANNETTE ZIPPELIUS, Georg-August-Universitaet Goettingen, Germany — We study a homogeneously driven granular fluid of hard spheres at intermediate volume fractions and focus on time-delayed correlation functions in the stationary state. The results of computer simulations using an event driven algorithm are compared to the predictions of generalized fluctuating hydrodynamics. The incoherent scattering function ($F_{\rm incoh}(q,t)$) follows time-superposition and is well approximated by a Gaussian $F_{\rm incoh} = \exp\left(-\frac{q^2}{6}\langle\Delta r^2(t)\rangle\right)$. For sufficiently small wavenumber q we observe sound waves in the coherent scattering function $S(q,\omega)$ and determine their dispersion and damping. Temperature fluctuations are predicted to be either diffusive or nonhydrodynamic, depending on wavenumber and inelasticity as characterized by incomplete normal restitution.

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