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Dynamic Structure Factor and Transport Coefficients of a Homogeneously Driven Granular Fluid in Steady State[1] KATHARINA VOLLMAYR-LEE, Bucknell University, USA, ANNETTE ZIPPELIUS, TIMO ASPELMEIER, Georg-August-Universitaet Goettingen, Germany — We study the dynamic structure factor of a granular fluid of hard spheres, driven into a stationary nonequilibrium state by balancing the energy loss due to inelastic collisions with the energy input due to driving. The driving is chosen to conserve momentum, so that fluctuating hydrodynamics predicts the existence of sound modes. We present results of computer simulations which are based on an event driven algorithm. The dynamic structure factor $F(q,\omega)$ is determined for volume fractions 0.05, 0.1 and 0.2 and coefficients of normal restitution 0.8 and 0.9. We observe sound waves, and compare our results for $F(q,\omega)$ with the predictions of generalized fluctuating hydrodynamics which takes into account that temperature fluctuations decay either diffusively or with a finite relaxation rate, depending on wave number and inelasticity. We determine the speed of sound and the transport coefficients and compare them to the results of kinetic theory.

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