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Velocity Distributions of Granular Gases with Long-Range Interactions KEVIN KOHLSTEDT, University of Kansas, ALEXEI SNEZHKO, MAXIM SAPOZHNIKOV, IGOR ARANSON, Argonne National Laboratory, JEFFREY OLAFSEN, University of Kansas, ELI BEN-NAIM, Los Alamos National Laboratory — We study velocity statistics of electrostatically driven granular gases with long-range interactions. Our experiments involve anisotropic dipole forces between particles due to either magnetic or hydrodynamic interactions. Generally, the velocity distribution is non-Maxwellian, and its high-energy tail has a stretched exponential form $P(v) \sim \exp\left(-|v|^{\xi}\right)$. We find a simple exponential tail, $\xi = 1$, for long-range dipole interactions, whereas $\xi = 3/2$ for short-range, hard-core interactions. This behavior is consistent with kinetic theory of driven dissipative particles. We conclude that velocity statistics of dissipative gases are sensitive to the form of the particle interaction.

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