Universal reference state in a driven homogeneous granular gas

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We study the dynamics of a homogeneous granular gas heated by a stochastic thermostat, in the low density limit. It is found that, before reaching the stationary regime, the system quickly "forgets" the initial condition and then evolves through a universal state that does not only depend on the dimensionless velocity, but also on the instantaneous temperature, suitably renormalized by its steady state value. We find excellent agreement between the theoretical predictions at Boltzmann equation level for the one-particle distribution function, and Direct Monte Carlo simulations. We conclude that at variance with the homogeneous cooling phenomenology, the velocity statistics should not be envisioned as a single-parameter, but as a two-parameter scaling form, keeping track of the distance to stationarity[1].

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[1] M. I. García de Soria, P. Maynar, and E. Trizac, Phys. Rev. E **85**, 051301 (2012)