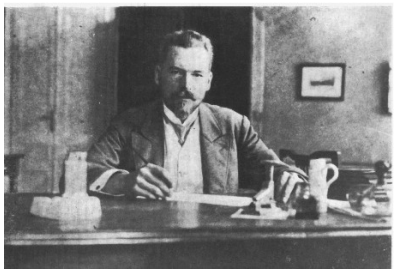

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Asymptotic tails of 2D Driven Granular Gases

Monday, 27 September 2021 17:55 (5 minutes)

The granular gas is a paradigm for understanding the effects of inelastic interactions in granular materials. Through this work, we obtain analytical results for a microscopic model for a granular gas where particles with two-dimensional velocities are driven homogeneously and isotropically by reducing the velocities by a factor and adding a stochastic noise. We find two universal regimes. For generic physically relevant driving, we find that the tail of the velocity distribution is a Gaussian with additional logarithmic corrections. Thus, the velocity distribution decays faster than the corresponding equilibrium gas. The second universal regime is less generic and corresponds to the scenario described by kinetic theory. Here, the velocity distribution is shown to decays an exponential with additional logarithmic corrections. The universality in the statistics is solely depends on the inelastic collisional interaction, and the presence of steady state. Therefore one would expect this to be valid for a large range of system parameters and for experimental scenarios of driven granular systems.

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