

Abstract Submitted
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Stress and velocity fluctuations in photoelastic granular avalanches¹ NATHALIE VRIEND, AMALIA THOMAS, University of Cambridge
— We study granular avalanches using a custom-built narrow chute where we release 2D photoelastic disks down an incline. Using high-speed imagery, we are able to obtain position and velocity data from particle tracking, and the full stress tensor, including normal and shear stress components, from the photoelastic response of interacting particles. Even though the avalanche is steady-state in time and space, minute fluctuations in velocity and forces away from the mean directly influence the rheology and fluidity. In this study, we analyze the correlation between velocity fluctuations and stress fluctuations in both the quasi-steady layer (close to the rough base) and the flowing layer (near the free surface). We correlate the fluctuations with direct measurements of the measured non-local properties within this photoelastic avalanche.

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Nathalie Vriend
University of Cambridge

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