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Changes in fluctuation patterns of a granular hopper flow near jamming MICHAL DICHTER, Brandeis University, SHUBHA TEWARI, Western New England University, BULBUL CHAKRABORTY, Brandeis University — Jams in gravity-driven flows in a vertical hopper with rigid walls occur under extremely inhomogeneous conditions, distinct from what is observed in spatially homogeneous flows. In this work, we use event-driven simulations to study velocity fluctuations in a collisional, 2D gravity-driven flow near jamming. We find a heterogeneous spatial distribution of velocity autocorrelation relaxation times, with the spatial structure changing significantly as the flow approaches jamming. At high flow rates, the flow at the center has lower kinetic temperatures and longer autocorrelation times than at the boundary. Unexpectedly, however, this trend reverses itself as the flow rate slows, with fluctuations relaxing more slowly at the boundaries though the kinetic temperatures remain high in that region. We suggest that this behavior is an indication of the flow becoming glassy close to the boundaries as jamming is approached.

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