

Abstract Submitted  
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**Velocity fluctuations in dense gravity driven granular flows obtained by internal imaging**<sup>1</sup> ASHISH ORPE, ARSHAD KUDROLLI, Department of Physics, Clark University, Worcester, MA 01610 — We measure the structure and dynamics of a gravity driven granular flow inside a silo using a fluorescent refractive index matched interstitial fluid. The particle positions are identified and tracked over long durations to obtain flow characteristics in the plug flow region. The side walls induce significant structural order only on the granular layer adjacent to the front walls. The distributions of the horizontal and vertical displacements for short time scales show fat tails compared to a Gaussian indicating large fluctuations in particle displacements and possible cage breaking. No significant spatial velocity correlations are observed away from the sidewalls where shear is absent. However, velocity correlations are observed near the side walls where a weak shear is also observed. By varying the orifice width, we also show that the flow properties are observed to be flow-rate independent indicating that the grain interactions are dominated by enduring contacts.

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