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The Role of Disorder in Gravity-Driven Granular Flow KERSTIN NORDSTROM, GRACE CAI, ANNA BELLE HARADA, Mount Holyoke College — The gravity-driven flow of a granular material in a silo has been studied for many years due to its obvious practical importance. It has been shown that placing a fixed intruder near the exit aperture can suppress clogging and enhance flow, but the dominant mechanisms have been debated. We present results on the flow of monodisperse grains in a quasi-2D silo in the presence of a fixed intruder using high speed video to track the individual grain motions. We find the intruder dramatically affects not only the structural order of the packing, but also the spatiotemporal dynamics of the flow, creating flow that alternates but lacks a characteristic frequency or frequencies. We find a combination of geometrical effects and enhanced granular temperature are responsible for suppression of clogs in the presence of the intruder; the dominant effect depends on where the intruder is placed.

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