

Abstract Submitted
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Particle Tracking Velocimetry and Granular Flow Correlations in Triangular Tumblers JOSEPH SZALKO, NICHOLAS POHLMAN, Northern Illinois University — Granular flow has traditionally been examined at steady state with time averaged results. Circular shaped tumblers with constant rotation rates eliminate most transient effects in dynamic flow. This research examines the transient flow induced by triangular shaped tumblers. High speed imaging and custom particle tracking velocimetry (PTV) are used to analyze several aspects of the flow: shear layer thickness along the variable angle of repose, transverse flow within the shear layer, and velocity profiles at different tumbler orientations and dimensions. Correlations of these properties with one another and the time/orientation dependence of the non-uniform tumbler are reported. Results indicate transient flow may not be equivalent to instantaneous conditions of steady flow. For example, highest velocities exist where the shear layer is thinnest.

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