



High-Speed Granular Chute Flows

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Nearly all granular flow models have a maximum value for the friction and therefore predict that flows on steep slopes will accelerate at a constant rate until the interaction with the ambient fluid becomes important. This prediction has not been tested by previous work, which has focused on relatively low slope angles where steady, fully developed flows occur after short distances. We report on experiments where we investigating flows over a much greater range of slope angles 30-50 degrees and flow depths 4-130 particle diameters with up to 20kg/s of sand flowing steadily. The data suggests that friction can be much larger than the $\mu(I)$ rheology or kinetic theories predict and suggest and that there may be constant velocity states above the angle of vanishing hstop.