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Flow Profiles and Fluctuations Measured for Granular Flow in a Vertical Channel[1] DONALD CANDELA, KEVIN FACTO, Univ of Mass - Amherst — The average velocity profiles and the velocity fluctuations were measured for flows of a dense granular medium (corn poppy seeds) through a long vertical channel, using NMR. The flow profiles seem to be in good agreement with non-local constitutive laws that have been proposed. In particular, there is a shear band near the channel wall with width that is independent of the flow rate. However, the measured velocity fluctuations do not agree with expectations from a simple interpretation of the underpinnings of the non-local rheology. For example, there are large fluctuations in the velocity of the central portion of the flow, away from the walls. This apparent discrepancy may be due to the absence of constant-pressure boundary conditions in granular flow through a fixed-size channel.

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