

Abstract Submitted  
for the DFD06 Meeting of  
The American Physical Society

**Kinematics of granular slurry** JIAFENG ZHANG, University of Illinois at Urbana-Champaign, KIMBERLY HILL, University of Minnesota — When mixtures of particles are rotated in a cylindrical drum, they first radially segregate and then axially segregate. Radial segregation has been shown to precede axial segregation and has been suggested as integrally tied to axial banding and pattern evolution. Recently, it has been shown that the rate of axial segregation increases dramatically when the interstitial fluid of air is replaced by water. Surprisingly, we have found the rate of radial segregation to decrease dramatically under the same conditions. To determine how the properties of the interstitial fluid affect the particle flow and also the segregation properties, we measure the kinematics of the particles with different interstitial fluids. We find that the flowing layer becomes thicker and the velocity and velocity fluctuations decrease dramatically when the interstitial fluid's viscosity increases. The difference in settling rate appears to affect radial segregation adversely, while the difference in velocity fluctuations appears to affect axial segregation positively.

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Date submitted: 07 Aug 2006

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