

Abstract Submitted
for the DFD07 Meeting of
The American Physical Society

Segregation in a split-bottom cell FAN YI, KIMBERLY HILL, ZOUBAIR ENTEZARI, University of Minnesota — In most devices, it is difficult to isolate granular segregation driven by a velocity gradient and associated Reynolds stresses from the effects of gravity and a volume fraction gradient. We use a split-bottom cell [1] to isolate the effect of a velocity gradient and associated Reynolds stresses on segregation associated with differences in particle size and density. In this geometry, a wide shear band is formed away from side walls, and only shear (perpendicular to gravity and the free surface) drives the preferential particle movement in the horizontal direction. Horizontal segregation was observed for both differences in the particle size and particle density. Different particle size ratios can influence the segregation speed: the smaller the particle size ratio, the faster the segregation. The segregation speed is also influenced by the width of shear band: a wider shear band will lead to faster segregation. We will discuss these differences in the context of horizontal diffusion, Reynolds stresses, and velocity differences.

[1] D. Fenistein and M. van Hecke, *Nature (London)* **425**, 256 (2003)

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Date submitted: 07 Aug 2007

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