

Abstract Submitted
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Microscopic properties and initial transients of the banded state in a rotated drum of granular material MICHAEL NEWEY, WOLFGANG LOSERT — We study the microscopic properties of the banded state of steel and glass beads in a rotated cylindrical drum. Imaging the top surface of the flow we can extract average velocity, drift, and diffusion. We study these properties from the start of rotation and throughout the band formation. We find that large particles begin to flow significantly faster at the region where a small particle band will form even before visible band formation. Contrary to what is expected by most modeling of the problem, we do not find any overall surface drift of small particles into like bands. We do find, however, an interesting pattern of particle drift as the particles flow down the surface. The velocity increase and the drift results show the critical importance of subsurface dynamics in driving the band formation.

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