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Analysis of microstructures in a Brazil Nut Problem JIN SUN, FRANCINE BATTAGLIA, SHANKAR SUBRAMANIAM, Iowa State University — It is challenging to describe dense granular flow at a macroscopic level using continuum models. In an attempt to fulfill this goal, current research has been focused on revealing microscopic structural information on prevailing many-body collisions and force chain formations, which are important aspects of the microscopic behavior of dense granular flows and can be used to improve continuum models. Molecular dynamics for granular flow (also referred to as discrete element method) is used to simulate segregation of a large particle in a partially fluidized dry granular bed consisting of smaller particles with an imposed low frequency vibration, known as the Brazil nut effect. It will be shown that the force chains formed by wall friction play an important role in ascending the large particle. Cluster information including cluster number evolution and size distribution, coordination number and spatial distribution will be analyzed, which could be used as additional parameters in continuum models.

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