

Abstract Submitted
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Discrete Element Simulation of Density Induced Segregation in Binary Granular Mixtures¹ ANNETTE VOLK, Univ of Cincinnati, URMILAGHIA, University of Cincinnati — We study density induced segregation of binary granular mixtures under vertical vibration using the open source discrete element method (DEM) code LIGGGHTS. Published experiments of vertically vibrated binary mixtures, varying in density ratio and observed under differing intensities of vertical vibration, are simulated and the final segregation state is quantitatively compared. Simulation results compare well with experimental data when the density ratio between the binary particles is relatively small but the comparison slowly deteriorates as the density ratio increases. A sensitivity study is performed for the coefficient of restitution since this quantity is absent from the published experimental data but has been shown to affect the amount of segregation. In industrial applications, mixing/segregation time is vital to processing, and hence, the relationship between the time to reach final segregation state and the density ratio of the binary particles is also investigated. Finally, in an effort to increase computational efficiency while maintaining accuracy, the effect of domain size on both time to reach final segregation state and amount of segregation in the final state is assessed.

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