

## Species Segregation Driven by a Granular Temperature Gradient

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Rapid granular flows are often polydisperse and consequently have a tendency to de-mix or segregate. Based on kinetic theory, several driving forces for this segregation have been previously identified. These analyses, however, have included an equipartition assumption. When this assumption is lifted, another driving force arises, namely one which includes the gradient of species temperature. To determine the magnitude of this driving force relative to the other driving forces, MD simulations of binary mixtures are examined. The system under consideration is characterized by zero mean flow between two, impenetrable boundaries of constant, unequal granular temperatures. Consistent with findings of previous researchers, all particle types segregate toward the lower temperature region, with the more massive particle having a higher affinity. Furthermore, the simulation results indicate that the non-equipartition effects are non-negligible. Another interesting observation is that the more massive particle may have a lower species temperature than its lighter counterpart.

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