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Instability in shocked granular gases NICK SIRMAS, MATEI RADULESCU, University of Ottawa — Shocks in granular media, such as vertically oscillated beds, have been shown to develop instabilities. Similar jet formation has been observed in explosively dispersed granular media. In the current study, we investigate the origin of this instability. Our previous work addresses this instability by performing discrete-particle simulations of inelastic media undergoing shock compression. By allowing finite dissipation within the shock wave, instability manifests itself as distinctive high density non-uniformities and convective rolls within the shock structure. By analyzing the time evolution of the material undergoing the shock wave compression and further relaxation, we found that the clustering instability is the dominant mechanism controlling this instability. In the present study we extend this work to investigate the instability at the continuum level. We model the Euler equations for granular gases with a modified cooling rate to include an impact velocity threshold necessary for inelastic collisions. Our results demonstrate a fair agreement between the continuum and discrete-particle models. Slight discrepancies, such as higher frequency non-uniformities in our continuum results may be attributed to the absence of viscous effects.

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