Hydrodynamics and Segregation in Poiseuille Flow of a Binary Granular Mixture RONAK GUPTA, MEHEBOOB ALAM, Jawaharlal Nehru Centre, Jakkur PO, Bangalore, India — Steady State profiles of hydrodynamic fields have been computed for the Poiseulle flow of a dilute bi-disperse granular mixture using DSMC (direct simulation Monte Carlo) method. The effects of mass bidispersity and inelasticity are studied and it is found that species segregation follows a non-monotonic trend with increasing mass-ratio if the particles are inelastic. Mixture velocity shows a similar trend. Nonequipartition of granular temperature is expectedly enhanced with increasing mass-ratio and inelasticity, but is additionally a strong function of Knudsen number. Effort is made to compare simulation results with a continuum theory for dilute binary granular mixtures, with the aim being to check if theory is able to predict the novel segregation tendencies uncovered in DSMC simulations.

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