

Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Averaged Equations for Species Interactions in Binary Particulate Systems DUAN ZHANG, JIN LIU, Los Alamos National Laboratory — Averaged equations for disperse two-phase flows are relatively well-studied compared to averaged equations for binary particulate systems. Disperse two-phase flows can be viewed as a limit of binary particulate system, in which the continuous phase consists of large amount of small particles, such as molecules, and the disperse phase consists of smaller number of large particles. Therefore averaged equations for disperse two-phase flows provide a guidance for the derivation of averaged equations for binary particulate systems. A correct system of averaged equations for binary particulate systems has to recover the averaged equations for disperse two-phase flows in this limit. In this talk it is shown that this can only be done by introducing an interspecies stress in a binary particulate system. Although the framework of deriving the averaged equations is applicable to general particulate systems, numerical simulations are performed for a granular system to study the behaviors of the species exchange force, intraspecies stresses and interspecies stress.

Duan Zhang
Los Alamos National Laboratory

Date submitted: 03 Dec 2007

Electronic form version 1.4