Ring Kinetic Theory for Granular Response Functions JAMES
DUFTY, University of Florida — The response functions for an isolated (cooling or
thermostated) granular gas are described by kinetic theory [1]. The linear kinetic
equation is obtained by a systematic expansion of the dimensionless BBGKY hier-
archy scaled relative to the mean free time and mean free path [2]. At first order
beyond Boltzmann the effects of ring (repeated) collisions and associated mode cou-
pling are included. Qualitative differences from the Boltzmann approximation are
described.

[1] "Kinetic Theory of Response Functions for the Hard Sphere Granular Fluid,"
A. Baskaran, J. Dufty, and J. Brey, J. Stat. Mech. 12, p12002 (2007); "Linear
Response for Granular Fluids," J. Dufty, in Frontiers in Nonequilibrium Physics,
Prog. of Theor. Phys. Supp., (to appear).
[2] "Kinetic Theory and Hydrodynamics for a Low Density Granular Gas," J. Dufty
in Challenges in Granular Physics, T. Halsey and A. Mehta, eds. (World Scientific,
N. J. 2002).

James Dufty
University of Florida