1056-76-1284   **Michael Shearer*** (`shearer@ncsu.edu`), Department of Mathematics, NC State University, Raleigh, NC 27695-8205, and **Laura Golick**, **Lindsay H May** and **Karen E Daniels**. *Particle size segregation in granular flow.*

Granular materials tend to segregate by size, density, shape or material properties, when vibrated or sheared. In this talk, I discuss modeling, analysis and simulations of a simple model formulated in 2005 by Gray and Thornton to describe segregation by size of a mixture of two sizes of particles in an avalanche. To test the model, we conducted experiments in an annular (Couette) cell, with a movable bottom plate that is rotated to generate shear. In this circumstance, the Gray-Thornton equation is modified to accommodate non-uniform shear. The result is a fair comparison between theory and experiment, together with indications of how the model might be refined to incorporate some effects observed in the experiments but absent from solutions of the model equation. (Received September 21, 2009)