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**Karen Daniels** and **Lindsay B.H. May\*** (lbhilber@ncsu.edu), North Carolina State University, Box 8205, Raleigh, NC 27695, and **Kasey Phillips** and **Michael Shearer**. *A model for particle size segregation in granular flow under nonuniform shear.*

A hyperbolic conservation law in one space variable and time describes particle size segregation in the presence of nonuniform shear. This PDE generalizes the Savage-Lun (1988) and Gray-Thornton (2005) models of segregation in granular avalanches, which assume uniform shear. Size segregation is observed in a Couette cell experiment in which a bidisperse mixture of spherical glass beads is sheared by rotating the bottom boundary. Experimental results are compared to analysis of the PDE model. (Received September 16, 2008)