Abstract Submitted
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Particle-size segregation in granular flow: a conservation law in two space dimensions.[1] MICHAEL SHEARER, North Carolina State University — Kinetic sieving is the process by which large particles rise in granular avalanches, while smaller particles fall. Recent models of this effect reduce to a scalar conservation law in two dimensions and time, but with non-constant coefficients, reflecting the shear needed to induce segregation. Various topics of significance to applications are considered using the theory and constructions of scalar hyperbolic equations: steady solutions in which the direction of flow is time-like, leading to a sharp estimate of how long a chute should be to guarantee full segregation; breaking of interfaces, forming an evolving lens-shaped mixture zone; and the connection to recent experiments of Daniels on shear flow, for which the model is adjusted to account for nonuniform shear, with the consequent loss of constant solutions.

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