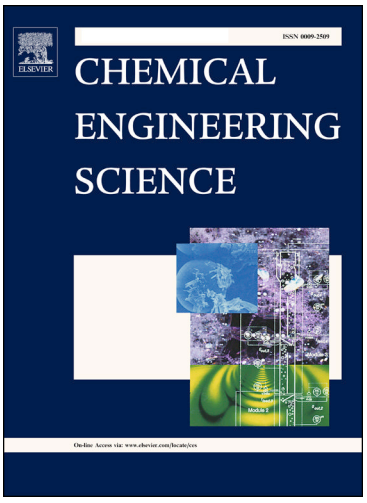


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# Continuum modeling of granular segregation during hopper discharge

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**Abstract**

Modeling segregation of size disperse granular materials during hopper discharge is important as hoppers are widely used in various industries. However, due to the complexity of segregation and hopper discharge flows, accurately modeling this process has been challenging. In this study, we apply a continuum transport model to predict segregation of size bidisperse granular material during the discharge of quasi-2D hoppers. We apply Discrete Element Method (DEM) simulations to reveal that segregation occurs mainly in a surface layer where particles are transported from the sidewalls to the hopper center. Velocity profiles are also developed based on a kinematic model and DEM data. The continuum model, which captures the interplay of advection, diffusion, and segregation, is then applied to predict the particle concentration distribution in the surface layer and the bulk. The continuum

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