



## IFPRI Review Brief

### Recent Developments in Dynamic Powder Flow

The International Fine Particle Research Institute wishes to commission a comprehensive critical literature review of recent developments in characterizing, modeling, and simulating dynamic flows of powders and grains. Decades of research on flows of powders and grains have produced a wide array of experimental data, models, and numerical simulations. Development of novel particle tracking experimental methods are providing particle-level characterization of flow kinematics and dynamics. Models range from highly complicated (kinetic theory) to deeply empirical ( $\mu(I)$  rheology). Advances in numerical simulations offer a means of exploring the detailed granular dynamics as well as a glimmer of hope for design of practical industrial units. We would like this review to provide a synthetic view of the state-of-the-art in all these areas, which is not limited by the reviewers own interests.

The scope of the review includes Intermediate and rapid flow regimes. Quasistatic flow is out of scope. Free surface and confined flows should be considered, as should particle mixing and segregation.

The primary audience for this review is the IFPRI membership, i.e., industrial scientists and engineers who are familiar with some aspects of dry powder flow but not necessarily experts. Thus, it is important to discuss the underlying principles, assumptions, and limitations of each experimental, modeling, and simulation approach. We hope that the review will eventually be published in the open literature.