IFPRI International Fine Particle Research Institute

IFPRI BRIEF TEMPLATE

Check One: ☒**Project** ☐**Review** ☐**Collaboration**
☐**Workshop** ☐**Other**

Descriptive Title	Reduced-order force law combining multiple cohesion mechanisms: Capillary, Van Der Waals, and Electrostatics.
Working Title[1]	Coarsened DEM model of cohesive forces
Technical Area[2]	M
Date	
Short Description	The complication of modeling cohesion and attraction among particles is a challenging albeit mechanistic problem. We propose to combine and validate a coarsened particle cohesion force model that agglomerates the effects of multiple attraction mechanisms. These mechanisms include capillary bridging, vDw, and potentially electrostatic charging.
Objectives	The ideal situation would be a coarsened DEM approach with time-evolving GLOBAL particle properties rather than tracking many particle-wise state variables. The global system properties and their evolution are calibrated from realistic systems in a test geometry that can be monitored and which can be used to infer bulk solid strength.
Scope	Limited to coarse DEM approaches that offer tractability/feasibility. Force laws would be sensitive to global size-distribution, humidity, temperature, and accumulated charge differential.

Recommended Contractors (2 or 3)		
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Submitted By:	
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[1] Title used in meeting agendas and file archives
[2] One or more from the following list: W = wet systems; D = dry systems; F = particle formation; SR = size reduction; M = modeling; SE = systems engineering

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