



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 Title¹	Coarsened DEM model of cohesive forces
Technical Area²	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)		
Name	Institution	Email Address
Farhang Radjai	CNRS/U Montpellier	franck.radjai@univ-montp2.fr
Namiko Mitarai	Niels Bohr Institute	mitarai@nbi.ku.dk
Ali Hassanpour	U Leeds	A.Hassanpour@leeds.ac.uk
Catherine O'Sullivan	Imperial	cath.osullivan@imperial.ac.uk

John Morrissey	U Edinburgh	J.Morrissey@ed.ac.uk
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Submitted By:	
Name	Organization
Ken Kamrin	MIT
Eric Grolman	Envalior

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

Raj Dave	NJIT
Mehrdad Pasha	Janssen
Kerry Johanson	Material Flow Solutions

Template v.1.0 - RB