IFPRI BRIEF TEMPLATE

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

Descriptive Title	Bulk friction and cohesion measurement at high/intermediate strain rates.
Working Title[1]	Characterizing friction and cohesion at range of strain rates
Technical Area[2]	Dry
Date	26/06/2019
Short Description	Cohesion and friction are not intrinsic powder properties. They are a function of stress and strain rate. Current industrial powder testers only characterize cohesion and friction at a quasi-static strain rate. However, higher strain rates are prevalent in most of industrial systems such as mix drums, high shear mixers, granulators, and feeders. Phenomena such as mixing, feeding, and coalescence in granulation is affected by powder cohesion and friction. Measurement of cohesion and friction at industrially relevant strain rates will provide better understanding and control of the processes.
Objectives	- Develop a methodology for measuring both cohesion and friction in a previously inaccessible range of strain rates. - Based on the measurements, develop constitutive relations and propose a modelling framework for implementation. - Demonstrate the predictive capabilities of this model for industrial scale process e.g. high shear mixer, hopper flow.
Scope	- Range of strain rates from quasi-static to high: with a focus on intermediate/high. - Industrial relevant wide range of stresses (150 pa to 100 kpa).

Recommended Contractors (2 or 3)		
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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