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Dense suspension splash KEVIN M. DODGE, IVO R. PETERS, JAKE ELLOWITZ, MARTIN H. KLEIN SCHAARSBERG[1], HEINRICH M. JAEGER, WENDY W. ZHANG, Physics Department & the James Franck Institute, University of Chicago — Upon impact onto a solid surface at several meters-per-second, a dense suspension plug splashes when liquid-coated particles are ejected from the plug bulk. We use discrete-particle simulations to examine the momentum transfers responsible for splash formation. We find that a simulation using a densely packed plug containing dry, noncohesive, inelastic grains reproduces the unexpected experimental finding that mixing larger particles into a suspension of small particles creates a bigger splash [1]. We also find that with increasing impact speed, the measured momentum distribution of ejected particles tends toward the result from the dry-grains-only simulation. These results support the idea that the splash from a low-viscosity solvent suspension is created by inertia-dominated collisions between particles. In this regime, viscous drag from the interstitial fluid is negligible. In future work, we will examine splash formation in simulations where particles approaching contact do experience viscous drag.

[1] Peters et al, Phys. Rev. Lett. **111**, 028301 (2013).

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