Abstract Submitted
for the DFD17 Meeting of
The American Physical Society

Modeling gas kinetic effects in drop collision and impact[1] MYKYTA V. CHUBYNSKY, University of Warwick, Coventry, UK, KIRILL I. BELOUSOV, ITMO University, St. Petersburg, Russia, DUNCAN A. LOCKERBY, JAMES E. SPRITTLES, University of Warwick, Coventry, UK — When liquid drops collide with each other (collision) or with a solid surface (impact), the thickness of the intervening gas film (which, in particular, gives rise to bouncing off wettable surfaces [2,3]) is often comparable to the mean free path of the gas molecules and thus gas kinetic effects are significant. We study drop collision and impact computationally using an interface-tracking finite element approach. The gas film is treated in the lubrication approximation. Gas kinetic effects are taken into account by introducing factors (functions of the Knudsen number) modifying the gas flow rate and shear stress. Our results for drop collision are in excellent agreement with those of Li [1] who modeled the gas using the full Navier-Stokes equations with an effective viscosity. For impact, where Li's approach cannot be used, we obtain good agreement with drop bouncing experiments [2,3]. [1] J. Li, PRL 117 (2016) 214502; [2] J. M. Kolinski *et al.*, EPL 108 (2014) 24001; [3] J. de Ruiter *et al.*, Nature Phys. 11 (2015) 48.

[1]We acknowledge the support of the Leverhulme Trust and the EPSRC (EP/N016602/1)

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Date submitted: 28 Jul 2017 Electronic form version 1.4