Abstract Submitted
for the DFD13 Meeting of
The American Physical Society

**Hard-sphere and inertial effects in colloidal liquid-gas systems** ANDREAS NOLD, BEN GODDARD, SERAFIM KALLIADASIS, Department of Chemical Engineering, Imperial College London, UK — Hard-sphere effects at a liquid-gas contact line on chemically heterogeneous substrates are studied employing density functional theory. For dynamic colloidal liquid-gas systems, a novel extension of dynamic density functional theory (DDFT) to include inertial effects [1,2] is introduced and numerical results for the motion of colloidal droplets are presented. In particular, we present results for the motion of the contact line between a substrate, a colloidal liquid and a colloidal gas phase. The link between the modelling approaches for dynamic colloidal systems using DDFT and the Navier-Stokes equations for molecular systems is discussed.

[1] Goddard, Nold, Savva, Yatsyshin and Kalliadasis, 2013, Unification of dynamic density functional theory for colloidal fluids to include inertia and hydrodynamic interactions: derivation and numerical experiments, J. Phys.: Condens. Matter, 25, 035101;
[2] Goddard, Nold, Savva, Pavliotis, Kalliadasis, 2012, General dynamical density functional theory for classical fluids, PRL, 109, 120603.

Serafim Kalliadasis
Department of Chemical Engineering, Imperial College London, UK

Date submitted: 01 Aug 2013 Electronic form version 1.4