

Abstract Submitted
for the DFD17 Meeting of
The American Physical Society

Modelling of cracking in evaporating, particle-laden sessile drops¹

ARANDEEP S. UPPAL, RICHARD V. CRASTER, OMAR K. MATAR, Imperial College London — Biological fluids can exhibit a variety of complex phenomenon. For example, during evaporation complex particle-laden droplets exhibit a gel transition at the contact line. This gel subsequently invades into the fluid phase and cracks. The resultant crack pattern can give an insight into the initial composition of the fluid. The cracking process itself is not well understood, with experimental observations giving multiple potential reasons. To further understand why and how these gels crack, we study the fracture of solid annuli within the framework of the Griffith theory. Under a quasi-static assumption, we consider hypotheses presented within the literature for two-dimensional annuli.

¹EPSRC Centre for Doctoral Training (EP/L016230/1) studentship for AU.

Omar Matar
Imperial College London

Date submitted: 27 Jul 2017

Electronic form version 1.4