Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Applying Inkjet Technology to Dispense Colloidal Nanoparticle Fluids[1] ANNIE O, HARJYOT MOHAR, VICTOR HERNANDEZ, ARTURO ESTRADA, LEONEL MUNOZ, SEWAN FAN, LAURA FATUZZO, STEVEN JIMENEZ, Hartnell College — The inkjet technology is widely employed to reliably deliver nanomaterials onto a substrate medium for further characterization and processing. To explore the feasibility of inkjet deposition for colloids, a novel drop-on-demand fluid dispenser is constructed to eject various types of liquids to produce atomized droplets. To make structured nanomaterials on a substrate using inkjet techniques, it is essential to determine the dynamical properties of the droplets as they are being formed. These would include the ejection speed, acceleration, terminal velocity and flight trajectories. For measuring these dynamic parameters, we successfully dispensed propylene glycol solution in different mixing ratios. This forms a reference fluid for establishing a baseline for our investigations. Our experimental data suggest that rapidly ejected droplets can be accurately modeled using Newton's equations and Stokes' law. In this conference, we describe our experiments consisting of an innovative inkjet dispensing apparatus in synchronization with a high-resolution camera imaging system. Furthermore, we plan to discuss our research efforts in dispensing microdroplets for relevant materials, such as chemical colloidal suspensions containing nanoparticles and polymer based fluids.

[1]Department of Education grant number P031S90007

Sewan Fan
Hartnell College

Date submitted: 15 Nov 2013 Electronic form version 1.4