1067-Z1-1985 **Kara L. Maki*** (makia001@ima.umn.edu), University of Minnesota, 114 Lind Hall, 207 Church Street S.E., Minneapolis, MN 55455, and **Satish Kumar** (kumar@cems.umn.edu), Dept of Chemical Eng and Materials Science, 151 Amundson Hall, 412 Washington Ave S.E., Minneapolis, MN 55455. *Drying Droplets of Colloidal Suspensions: Role of Rheology.* Preliminary report.

When a coffee droplet dries on a countertop, a dark ring of coffee solute is left behind, a phenomenon often referred to as "the coffee ring effect". The droplet initially has a uniform distribution of solute, but flow inside the droplet carries the solute to the droplet edges as evaporation occurs. A closely related yet less-well-explored phenomenon is the formation of a layer of particles, or skin, at the surface of the droplet. This phenomenon is highly relevant to the coating and drying of colloidal suspensions, and the goal of this work is to investigate the underlying mechanisms.

We consider the drying of a thin axisymmetric droplet of a colloidal suspension on a horizontal substrate. The fluid motion is described by applying the lubrication approximation, and the transport of the particles is described using the full convection-diffusion equation. The particles are assumed to influence the rheology of the droplet through their effect on the suspension viscosity. The highly coupled governing system of equations is simulated using a finite-difference scheme based on a moving overset grid method. Preliminary findings along with future plans will be discussed. (Received September 22, 2010)