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**Development of local interfacial strains and stresses in the formation of asymmetric particle-stabilized capsules**[1] SHELLEY ANNA, CHARLES SHARKEY, Carnegie Mellon University — Particles adsorbed at fluid interfaces can stabilize bubbles and droplets against coalescence. However, the method of generating the interface strongly impacts interparticle interactions, and in turn, interfacial microstructure, rheology, and stability. By controlling the adsorbed concentration of particles via residence time in a long channel, we generate non-spherical capsules that retain their shape for at least tens of hours. The capsule shape is in part determined by the dynamics of the bubble as it exits the tube. In this talk, we use image analysis to examine the development of interfacial strains during capsule formation at the channel exit. Tracking the bubble radius profile as a function of time allows us to examine the evolution of interfacial area and bubble volume, as well as the dilation rate profile along the interface. These observations allow us to infer the development of interfacial dilational and buckling stresses that lead to the capsule shape stability. We compare the interfacial strain evolution for clean, surfactant, and particle-laden interfaces as a function of the composition of the interfacially active component. These observations provide a direct connection between colloidal and production factors, and interfacial mechanics and capsule stability.

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