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Mechanical characterization of diblock copolymer "armored" emulsion droplets DAMITH P. ROZAIRO, ANDREW B. CROLL, North Dakota State University — There has been an increased interest in block copolymer vesicles due to a plethora of possible application ranging from targeted drug delivery to cosmetically active agents. In this regard, understanding the physics of the block copolymer vesicle and its morphology is critical to the rational development of these technologies. As a step towards more complex vesicle structures, we describe experiments in which we carefully examine the interface and morphology of polystyrene-b-polyethyleneoxide (PS-PEO) emulsion drops. In our study, PS-PEO acts as a surfactant and at the toluene-water interface creates a monolayer, inhibiting drop recombination and minimizing interfacial energies. Our experiments are conducted in a water cell where the buoyant force is exploited to push drops against a thin sheet of mica. The shape of the drops is measured using an upright confocal microscope and compared with a Bashforth-Adams model in order to examine the mechanical response to the buoyant force. We observe unique dynamics as the drops buckle at short timescales trapping a small pocket of fluid which slowly drains away. Furthermore, the influence of polymer concentration, changes in pH and block copolymer architecture on the morphology and dynamics of the droplets is examined.

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