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Experiments in oil-water ring-sheared drop[1] SHANNON GRIFFIN, PATRICK MCMACKIN, FRANK RILEY, SHREYASH GULATI, AMIR HIRSA, Rensselaer Polytechnic Institute, JUAN LOPEZ, Arizona State University — Launched to the International Space Station (ISS) in late July 2019, the ring-sheared drop (RSD) is a containerless reactor where surface tension provides fluid containment, and shear is conveyed primarily through surface shear viscosity. The RSD is a 2.5 cm diameter drop constrained by two thin rings. A stationary ring contacts the drop in one hemisphere, and a rotating ring contacts in the opposite hemisphere. The RSD allows the study of sheared fluid interfaces and how they affect amyloid fibril formation. Amyloid fibrils of certain brain proteins play central roles in some neurodegenerative diseases, such as Alzheimer's or Parkinson's. The RSD was studied in the lab using a density-matched silicone oil-water system. Through these experiments, previous computational work on the RSD was verified. Drop deformation was found to be a balance between viscous, inertial, and capillary forces. These laboratory experiments provided some evidence for the robustness of the RSD.

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