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Marangoni forces on oil droplets rising in a stratified fluid DE ZHEN ZHOU, ADAM BINSWANGER, University of California, Merced, JOSHUA ROE, None, TRACY MANDEL, University of New Hampshire, MAXIME THELLARD, DUSTIN KLECKNER, SHILPA KHATRI, University of California, Merced — During the 2010 Deepwater Horizon oil spill, about 5 million barrels of petroleum discharged from the Macondo Well into the Gulf of Mexico. Oceanographic studies (McNutt, 2012) estimated that approximately 40 percent of that oil was trapped beneath the ocean surface, primarily in regions with strong oceanic density gradients. Previous numerical studies have shown that Marangoni forces may play a role in the trapping phenomenon (Blanchette, 2012). This work aims to verify the role and significance of interfacial surface tension effects of oil droplets rising through a sharply density-stratified fluid at intermediate Reynolds numbers. We will present experimental results comparing the motion of oil droplets rising through a sharp density stratification with varying Marangoni forces.

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