Why does coffee spill more often than beer? (w/ Video)

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Watch even the most careful waiter bring a cup of coffee to your table, and you'll realize that carrying liquid is not easy. When set in motion, the coffee starts sloshing, little waves appear, and spilling may ensue, leaving you with a half-empty cup. Beer, on the other hand, does not slosh as readily. Emilie Dressaire, an Assistant Professor of Mechanical and Aerospace Engineering, speculated that the difference was due to the foam on the beer and she and her colleagues from Princeton University set out to better understand and quantify this common observation.

Using a high-speed camera, a moving stage, and fluid with and without a head of foam, they studied the waves following a sudden motion. Their

measurements showed that foam indeed reduces the sloshing. But much to their surprise, they also discovered that foam is very efficient at damping waves: just a few layers of bubbles suffice. The efficiency of the foam, they concluded, comes from viscous dissipation. As the waves form and travel, the foam rubs against the walls of the containers. This rubbing costs a lot of energy, which results in damping.

Their findings, which they've made available as an informative and engaging video clip, were presented at the 67th Annual Meeting of the American Physical Society's Division of Fluid Dynamics (APS-DFD), held in San Francisco in November 2014. Dressaire concedes that the notion of researchers studying beer may be surprising. "There are different ways to approach a scientific or technological question, and it's good to keep an open mind, because interesting ideas can come from the most familiar observations," she comments. "Students are great at connecting their everyday life to some of the most difficult problems. To this point, their work has serious and promising applications in numerous industrial applications, such as the transport of liquid as cargo."

Some might say that the work is a fitting addition to the legacy of biochemist Joseph L. Owades ('44, '50): he was responsible for creating the formula for the world's first light beer.

Provided by New York University

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