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**Alcohol drops on miscible liquid: mixing or spreading?** HYOUNGSOO KIM, Princeton University, KOEN MULLER, Delft University of Technology, OREST SHARDT, Princeton University, SHAHRIAR AFKHAMI, New Jersey Institute of Technology, HOWARD STONE, Princeton University — $-abstract-$We studied how a sessile drop of alcohol behaves when placed on a fully miscible liquid. The dynamics of the subsequent mixing and spreading were captured by using a high-speed camera and investigated by varying parameters (e.g., surface tension, density, and viscosity). We observed that a deposited alcohol drop on a liquid bath remains as a floating lens shape, the alcohol liquid leaks out along the rim of the droplet, and it spreads axi-symmetrically along the bottom liquid interface. To visualize spreading and mixing features, we used time-resolved Particle Tacking Velocimetry and a Schlieren method. We observed a localized mixing flow at the rim of the floating droplet where the maximum flow speed is obtained, driven by a solutal Marangoni effect. Underneath the interface of the bath liquid, a viscous boundary layer develops while the alcohol liquid spreads along the radial direction. We also observed a finite quasi-steady interfacial flow velocity regime after the alcohol droplet touched the bottom liquid surface. In this regime, the flow speed linearly increases inside the floating lens, and outside the lens the flow speed decays along the r-direction with a power-law slope, $U_r \sim r^{-1/2}$. Physical arguments to support the observations will be discussed.

Hyoungsoo Kim
Princeton University

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