

Abstract Submitted
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Capillary surfers: Self-propelling particles at an oscillating fluid interface¹ GIUSEPPE PUCCI, Brown University and Institute of Physics of Rennes, DANIEL HARRIS, Brown University — In the present work, we explore the dynamics of millimetric bodies trapped at the air-water interface of an oscillating bath. The relative vertical motion of the body and the free surface leads to the generation of propagating capillary waves. We demonstrate that when the rotational symmetry of an individual particle is broken, the particle can steadily self-propel along the interface. Such self-propelled particles interact with one another through their mutual capillary wavefield and resultant fluid flows, and exhibit a rich set of collective modes characterized by a discrete number of equilibrium spacings for a given set of experimental parameters. Our results open the door to further investigations of this novel active system at the fluid interface. Ongoing work and future directions will be discussed.

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