

Abstract Submitted
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Viscous mechanism for Leidenfrost propulsion on a ratchet GUIL-
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Palaiseau, France — An evaporating drop placed on a ratchet shaped substrate
self-propels, as discovered by Linke et al. in 2006. Sublimating platelets of dry ice
do the same, and we discuss a possible viscous mechanism for these motions. We
report that the flow of vapor below the levitating material is rectified by the asym-
metric teeth of the ratchet, in the direction of descending slopes along each tooth.
As a consequence, the resulting viscous stress can entrain the material in the same
direction, and we discuss the resulting self-propelling force.

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