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**Leidenfrost wheels** AMBRE BOUILLANT, TIMOTHEE MOUTERDE, PHILIPPE BOURRIANNE, CHRISTOPHE CLANET, DAVID QUERE, Ecole polytechnique ESPCI Paris — The high mobility of Leidenfrost drops is commonly attributed to the lack of contact with the hot substrate, and it makes them sensitive to tiny forces, such as gravity or airflows. However, we observed that drops deposited without initial velocity on strictly horizontal substrates self-propel in random directions. This phenomenon is triggered by confinement. PIV measurements reveal that, as the drop aspect ratio of the drop becomes of order unity, internal motions of liquid systematically switch from toroidal axisymmetric to asymmetric rolling. Such a flow reshapes the vapor thickness and tilts it, as evidenced by interferometric measurement, hence leading to propulsion. Droplets are thus found to generate their own dynamics and self-propel despite the absence of external field, which contributes to their legendary mobility

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