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**Paramagnetic Leidenfrost Drops** KEYVAN PIROIRD, BAPTISTE DARBOIS TEXIER, CHRISTOPHE CLANET, DAVID QUERE, Physique et Mécanique des Milieux Hétérogènes, CNRS, ESPCI, Paris France & Ladhyx, CNRS, Ecole Polytechnique, Palaiseau, France — Liquid oxygen drops have two remarkable properties: 1) they undergo Leidenfrost effect on a substrate at room temperature because of their low boiling point ( $-183\text{ }^{\circ}\text{C}$ ): they levitate on a cushion of their own vapor which confers them extreme mobility and thermal insulation ; 2) they are paramagnetic hence subjected to a force in the presence of a magnetic field gradient. — We study the effect of such a gradient on liquid oxygen drops using rare-earth permanent magnets. By changing the distance between the magnet and the drop, this additional force can be tuned at will between zero and roughly ten times the gravitational force. We define a magneto-capillary length that takes into account the modification of the shape of an oxygen drop in a magnetic field gradient. — We show that oxygen drops, usually moving on a horizontal substrate with almost no friction, can be stopped and captured by a local magnetic field, if slow enough. For high velocities, the drop is not captured but loses a certain amount of energy while crossing the field. We study this special dissipation occurring in the presence of a magnetic field.

Keyvan Piroird  
Physique et Mécanique des Milieux Hétérogènes,  
CNRS, ESPCI, Paris France & Ladhyx, CNRS,  
Ecole Polytechnique, Palaiseau, France

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