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Explosion of Leidenfrost Droplets[1] FLORIAN MOREAU, University of Liege, PIERRE COLINET, Universite Libre de Bruxelles, STEPHANE DORBOLO, University of Liege — When a drop is released on a plate heated above a given temperature, a thin layer of vapour can isolate the droplet so that it levitates over the plate. This effect was first reported by Leidenfrost in 1756. However, this fascinating subject remains an active field of research in both fundamental and applied researches. In this work, we focus on what happens when surfactant is added to the drop. The aim is to study the influence of a decrease of the surface tension. Surprisingly, as the droplet evaporates, suddenly it explodes. The evolution of the droplet and the resulting explosion are followed using a high speed camera. We show that when a critical concentration of surfactant is reached inside the drop, a shell of surfactant is formed leading to the explosion.

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