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The impact of a Leidenfrost drop on a spoked surface texture SAMIRA SHIRI, Boston University, COLIN PATTERSON, GE Aviation; Boston University, JAMES BIRD, Boston University — Liquid drops can bounce when they impact nonwetting surfaces. Recently, studies have demonstrated that the time that the bouncing drop contacts a superhydrophobic surface can be reduced by incorporating ridged macrotextures on the surface. Yet the existing models aimed at explaining this phenomenon offer incompatible predictions of the contact time when a drop impacts multiple intersecting macrotextures, or spokes. Furthermore, it is unclear whether the effects of the macrotexture on the drop hydrodynamics extend to non-wetting surfaces in which direct contact is avoided by a thin vapor layer. Here we demonstrate that the phenomenon observed for macrotextured, superhydrophobic surfaces extends to macrotextured, wettable surfaces above the Leidenfrost temperature. We show that the number of droplets and overall residence time both depend on the number of intersecting spokes. Finally, we compare and contrast our results with mechanistic models to rationalize various elements of the phenomenon.

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