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The failure of a superhydrophobic surface under external flow¹
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HOWARD STONE, Princeton University, MURI SLIPS TEAM — The advantages
of superhydrophobic surfaces (SHS), such as ultra water-repellency, drag reduction
and enhanced heat transfer, rely on the existence of the air trapped inside the surface
geometries. Thus, it is important to study the failure of SHS, i.e., how the air-filled
cavities are filled with water. Most of the previous work on this topic focuses on
static pressure-driven failure. Here, we study experimentally the dynamic failure of
SHS under an external flow. Conditions leading to failure are identified. The effects
of both the pressure and the shear from the external flow on the failure of SHS are
discussed.

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