

# Towards monodisperse spray

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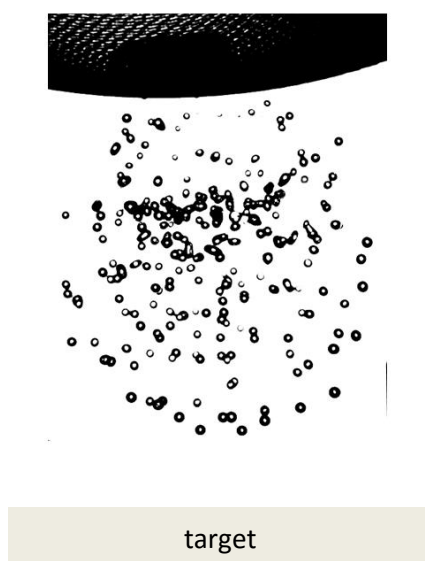
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Sprays are widely used in domestic, medical, industrial and agricultural applications and in most applications monodisperse droplets of a tuneable size are preferred. It is still a challenge to produce monodisperse drops with a method that requires little energy and is environmental friendly.

We explore a novel, low-cost, low-pressure atomization method to produce monodisperse sprays using superamphiphobic meshes. We used stainless steel meshes with a mesh size of about 300µm, the meshes were coated with a superamphiphobic layer following our previously developed method [1] of building up a network of silica spheres which were hydrophobized using the semifluorinated alkylsilane (trichloro-(1H,1H,2H,2H-perfluorooctyl) to achieve superamphiphobicity.

The formation of the spray (example cp. figure 1) was followed with a high speed camera and the droplets were collected on a target to analyze the droplets further in terms of amount of liquid passing the meshes and monodispersity.

The proposed technique enables to atomize both, water as well as organic liquids, such as hexadecane. The size of the drops directly scales with the mesh size.



**Figure 1:** Spray produced by impact of water droplet on a mesh coated with a superamphiphobic layer

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[1] Deng, X.; Mammen, L.; Butt, H.-J.; Vollmer, D. Science 2012, 335, 67.