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Writing bubbles SANDER WILDEMAN, HENRI LHUISSIER, CHAO SUN, ANDREA PROSPERETTI, DETLEF LOHSE, University of Twente — We report on the nucleation of bubbles under a solid sphere immersed in a supersaturated liquid that is gently rubbed against a surface. For a fixed liquid supersaturation, bubbles are observed only above a certain rubbing velocity threshold. Above this threshold and provided that bubbles adhere better to the surface than to the sphere, a regularly spaced row of growing bubbles is left behind on the surface. Direct observation through a transparent sphere shows that each bubble in the row actually results from the early coalescence of several microscopic bubbles, which nucleate between the sphere and the surface. Together with the influence of the degree of supersaturation and the normal force between sphere and surface, we study the influence of the liquid itself (water or ethanol), the sphere material (glass, metal or Teflon) and of the surface roughness (polished or unpolished). Regardless of its precise origin, this method of "writing bubbles" also provides a simple way to spatially and temporally control the nucleation of bubbles on a surface and to study their interactions.

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