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New thermal-sensitive superhydrophobic material RAPHAELE THEVENIN, PMMH Laboratory, ESPCI / Ladhyx, Ecole Polytechnique - France, ZI LIANG WU, PATRICK KELLER, Institut Curie - France, ROBERT E. COHEN, Chemical Engineering, MIT - USA, CHRISTOPHE CLANET, Ladhyx, Ecole Polytechnique/PMMH Laboratory, ESPCI - France, DAVID QUERE, PMMH Laboratory, ESPCI / Ladhyx, Ecole Polytechnique - France — Roughness of superhydrophobic surfaces plays a crucial role in the wetting properties of these surfaces. We propose to modify the roughness of a surface by applying external stimuli to change its wetting properties. In this spirit, we study superhydrophobic surfaces consisting of arrays of micro-pillars made with a liquid crystal elastomer. These liquid crystals change their orientation when heated, so that the height of the pillars decreases when the surface temperature increases; and this is perfectly reversible. We study the impact of such a thermal-actuation on the static and dynamic wetting properties of such surfaces and show superhydrophobicity of this new material can indeed be tuned using temperature stimuli.

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