

Robust hydrophobic surfaces from hydrophilic materials using shape optimization

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It is a well established result that hydrophobicity of a surface can be enhanced by a regular pattern of micrometric sized pillars, possibly leading to the so called superhydrophobicity. However, it is much more difficult to convert a hydrophilic material into a hydrophobic or superhydrophobic one by surface patterning. In this ongoing project, we apply a shape optimization approach to this problem. Different micrometric textures are compared in term of apparent contact angle and robustness to pressure perturbations and an optimization procedure to identify the optimal design is described.