Abstract Submitted
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Wetting morphologies on chemically nanopatterned surfaces[1] ANTONIO CHECCO, Brookhaven National Laboratory, OLEG GANG, BENJAMIN M. OCKO — We study the wetting of simple, volatile liquids on model chemical nanopatterns created using Local Oxidation Nanolithography. This technique makes use of a biased, metallic AFM tip to locally oxidize the methyl-terminations of a self-assembled monolayer (octadecylthrichlorosilane) into carboxylic acid termination[1]. With this method we have realized parallel, 50 to 500 nm wide, wettable stripes (carboxylic) embedded into a non-wettable (methyl) surface. Several organic (polar, non-polar), volatile liquids have been condensed onto the wettable stripes and the resulting droplet morphologies have been studied in-situ by using an environmental AFM. We show that close to saturation and for droplet thickness less than 10 nm long-range forces are relevant to the nanoliquid shape. These results are well described by Density Functional Theory assuming dispersive molecular interactions. In addition, we explore the dynamics of condensation/evaporation of the liquid nanodrops.

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Antonio Checco
Brookhaven National Laboratory

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