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A measurement platform for studying wetting phenomena at the nanoscale MICHAEL ENGEL, PETER BRYANT, RONALDO GIRO, RODRIGO NEUMANN, PHAEDON AVOURIS, MATHIAS STEINER, IBM Research — Understanding surface wetting and liquid-solid interactions at small scales is an important scientific task with broad technological implications. We report on the design, development, and application of an integrated analysis platform to experimentally characterize liquids at the nanoscale. The platform provides an integrated, graphene-based electronic sensor array for *in-situ* optical micro-spectroscopy and atomic force microscopy. We demonstrate the experimental capabilities of the platform by applying various measurement functionalities. Specific demonstrations include electrical differentiation between liquids supported by Raman spectroscopic characterization, as well as monitoring surface wetting dynamics in real time. Finally, we explore the sensitivity limits of the platform by recording topographies and optical spectra of individual oil droplets with volumes of less than ten attoliters. Due to its integrated nanoscale measurement capabilities, the platform will have useful applications in scientific research and technology development.

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