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We present here a proof-of-principle study of scanning probe tips defined by planar nanolithography and integrated with AFM probes using nanomanipulation. The so-called 'nanobits' are 2-4 μm long and 120-150 nm thin flakes of Si3N4 or SiO2, fabricated by electron beam lithography and standard silicon processing. Using a microgripper they were detached from an array and fixed to a standard pyramidal AFM probe or alternatively inserted into a tipless cantilever equipped with a narrow slit. The nanobit-enhanced probes were used for imaging of deep trenches, without visible deformation, wear or dislocation of the tips of the nanobit after several scans. This approach allows an unprecedented freedom in adapting the shape and size of scanning probe tips to the surface topology or to the specific application.
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