

Scanning Probe Lithography on Semiconductor Heterostructures: Technology and Applications

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Abstract :

In the past few years, scanning probe lithography has been established as a complement to conventional patterning techniques, such as electron beam lithography or optical lithography. It is based upon local modification of a semiconductor surface, or a thin metal film on top of a semiconductor, by the tip of a scanning probe microscope. This is usually achieved by simple scratching or by local, tip-induced oxidation of the surface. The major advantages of scanning probe lithography are (i) fabrication of in-plane gates in otherwise not gateable samples, (ii) simple definition of multiply connected geometries and (iii) the preparation of layered, nanostructured gates. In this presentation, the technique will be introduced and its distinct advantages will be discussed using various examples.