

## **Field Induced Thickening of Au-coated Nanosize Si-tip and Field Emission from PR-coated Si-tip**

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We have fabricated the nanosize Si-tip using conventional microfabrication techniques. The thin photoresist (PR) film and the Au layer were coated independently on the bare Si tip and examined the characteristics of the coated tip under the applied voltage. Initially, a nanosize Si tip was fabricated on the n-type, (100) low resistive (0.05-0.005 ohm-cm) Si wafer using the 2 micron dot array pattern. With the 2 micron diameter oxide etch-mask pattern with 250nm thickness SiO<sub>2</sub>, reactive ion etching were carried out using isotropic SF<sub>6</sub> etching only. Final sharpening oxidation procedure followed by 7:1 BHF oxide etching was carried out. The ~200nm Au thin layer was deposited using thermal evaporation and the diameter of the tip after deposition was changed from ~ 15nm to ~31nm. Upon negatively biased on the PR-coated tip, the current was initially measured to be ~ μA and the arcing was finally observed. The positively biased Au coated Si tip presented the thickening of the tip due to field induced stress .

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