

Abstract Submitted  
for the MAR12 Meeting of  
The American Physical Society

**Primary electron beam generation in Near-Field-Emission SEM** DANILO ANDREA ZANIN, HUGO CABRERA, LORENZO GIUSEPPE DE PIETRO, URS RAMSPERGER, DANILO PESCIA, Laboratory for Solid State Physics, ETH Zurich, Switzerland — Due to low electron energies used in Near-Field-Emission SEM (NFE-SEM), the understanding of the physical phenomena governing the primary electron beam generation is of fundamental relevance. The geometry and the chemical composition of the ultra-sharp field emitter have been therefore investigated by using different well-known electron microscopy techniques. The last hundreds of nanometers of such a field emitter, produced by electrochemical etching of a tungsten wire, can be macroscopically approximated by a cone with angle of aperture of about  $6^\circ \pm 1^\circ$ . The shape of the very apex is strongly dependent on the preparation conditions. Moreover, the only remaining contamination after the annealing procedure of the tungsten tips is a tungsten-oxide coating, uniformly distributed on the surface.

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Date submitted: 11 Nov 2011

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