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Energy Analysis in Near Field-Emission SEM LORENZO GIUSEPPE DE PIETRO, DANILO ANDRA ZANIN, HUGO CABRERA, URS RAMSPERGER, DANILO PESCIA, MEHMET ERBUDAK, Laboratory for Solid State Physics, ETH Zurich — In Near Field-Emission Scanning Electron Microscopy (NFESEM) cold field emitted electrons from a sharp polycrystalline W-tip are the source of a primary electron beam. The applied voltage for field-emission accelerates these electrons up to some tens of eV. After having interacted with the sample, secondary and backscattered electrons are detected, while an STM controller is used to scan the tip at a constant average distance (10 to 20 nm) from the sample surface. This technique has been used for topography images on various metals and semiconductors achieving nm lateral resolution. In case of a W(110) surface covered by Fe islands a chemical contrast was observed. We recently added an energy analysis of the electrons used for imaging. The energy distribution of this electrons from the sample shows presence of both secondary and back scattered electrons. The ratio of the two groups of electrons may vary for different distances and energies. In view of including spin polarization analysis, we are currently working to optimize the secondary electron yield.

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