

Reconstruction of field ion microscopy characterized tungsten tips at the atomic level

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Non-contact atomic force microscopy (ncAFM) has proven to be a valuable tool for surface characterization with atomic-resolution. For a quantitative comparison between force spectroscopy experiments and corresponding analytical models, knowledge of the true tip geometry is required. One method for gaining information about the geometry of metallic tips is the field ion microscopy (FIM) technique. In order to determine the tip geometry with FIM we employ the reconstruction of ball models based on the field ion micrograph. For this purpose we have developed software which allows for the creation of hemispherical ball models, the determination of atoms imaged brightly in FIM and the possibility of both the addition and removal of tip atoms. In order to ascertain the tip geometry of a FIM characterized tip we compare the field ion micrograph and the projection of the tip model at the atomic level. We will demonstrate the determination of tip geometry and corresponding tip radius for electrochemical etched tungsten tips.