

Abstract Submitted
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BEEMfit: Ballistic Electron Emission Microscopy Spectra Fitting for Schottky Barrier Visualization¹ VINCENT LABELLA, SUNY Polytechnic Institute, WESTLY NOLTING, University at Albany-SUNY — The Schottky barrier is the electrostatic barrier between rectifying metal-semiconductor interfaces that has high technological impact. Visualizing the nanoscale fluctuations in barrier height can be accomplished by mapping the barrier height with ballistic electron emission microscopy (BEEM) an STM based technique. Crucial to this technique is a high speed and robust algorithm for fitting the tens of thousands of BEEM spectra that are collected to generate the map. This presentation will describe our algorithm that fits to the simplified power law form of the Bell and Kaiser BEEM model by linearizing the data and utilizing linear regression. It searches over all possible fits and returns the Schottky barrier height ϕ_b and amplitude of the best fit according to the R^2 value. It is freely available on-line at www.labellagroup.org and does not require initial guessing of the fitting parameters that are often needed in non-linear curve fitting methods. Its performance will be demonstrated as well as the insight it provides into the physics of the interface and transport of the hot electrons by utilizing it across numerous metal-semiconductor systems.

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