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Near-field photoemission microscopy A. FISHER, St. Lawrence University, C.T. CHADWICK, H.D. HALLEN, North Carolina State University —
Near-field scanning optical microscopy (NSOM) with UV illumination can be used to provide high resolution images of photoelectron production as well as optical and electrical data. A tunable ultraviolet laser can be used to create photoelectrons, which can be collected with the metal coating on the NSOM tapered optical fiber tip. The collection geometry does not permit energy analysis so the source energy must be varied for spectroscopy, but the close proximity of the tip to the sample allows the creation of an extremely high electric field with only a modest (few volt) bias between the tip and sample. These high fields can change the local work function of the material and thus aid the removal of the electrons. This NSOM configuration permits variations of laser wavelength, tip-sample distance, collection voltage, and lateral position on a sample, enabling robust model testing of voltage-assisted photoemission.

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