Apertureless scanning near-field microscopy at terahertz frequencies: development and applications

H. T. STINSON, J. S. WU, A. S. MCLEOD, University of California - San Diego, J. RAN, Columbia University, A. STERN-BACH, M. M. FOGLER, University of California - San Diego, D. N. BASOV, Columbia University — We discuss the development of an apertureless near-field scanning microscope capable of nano-scale imaging and spectroscopy measurements in the terahertz frequency range. We describe potential applications of this instrument at both elevated and cryogenic temperatures; such as imaging the metal-insulator transition in vanadium dioxide (VO$_2$) thin films,$^1$ and spectroscopy measurements of high-temperature cuprate superconductors.$^2$

$^1$Qazilbash et. al., Science 318, 1750 (2007)