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Single & Multiprobe Apertureless Thermal Imaging of Electromagnetic Excitation Over A Wide Range of Wavelengths RIMMA DEKHTER, Nanonics Imaging Ltd., AARON LEWIS, Hebrew University of Jerusalem, Dept of Applied Physics & Benin School of Engineering & Computer Science, SOPHIA KOKOTOV, PATRICIA HAMRA, BOAZ FLEISCHMAN, HESHAM TAHA, Nanonics Imaging Ltd. — Near-field optical effects have generally been detected using photodetectors. There are no reports on the use of the temperature changes caused by electromagnetic radiation using thermal sensing probes for scanned probe microscopy. In this paper we apply our development of such probes to monitor the effects of electromagnetic radiation at a number of different wavelengths using the heating caused in a sample by specific wavelengths and their propagation. The paper will catalogue effects over a wide spectrum of wavelengths from the near to mid infrared. The thermal sensing probes are based on glass nanopipettes that have metal wires that make a contact at the very tip of a tapered glass structure. These probes are cantilevered and use normal force tuning fork methodology to bring them either into contact or near-contact since this feedback method has no jump to contact instability associated with it. Data will be shown that defines the resolution of such thermal sensing to at least the 32 nm level. In addition the probes have the important attribute of having a highly exposed tip that allows for either optical sensing methodologies with a lens either from directly above or below or heat sensing with a single or additional probe in a multiprobe scanning probe system.

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