

Abstract Submitted  
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**Numerical Aperture Increasing Lens Assisted Microscopy and Spectroscopy** ANTHONY N. VAMIVAKAS, MESUT G. ERASLAN, M. SELIM UNLU, Dept. of Electrical and Computer Engineering, Boston University, BENNETT B. GOLDBERG, Dept. of Physics, Boston University — A Numerical Aperture Increasing Lens (NAIL) is used for high resolution far-field microscopy and spectroscopy of semiconductor nanostructures. Incorporating NAIL into our low temperature confocal microscope, we have been able to perform high collection efficiency spectroscopy of single, self-assembled InGaAs/GaAs quantum dots. We plan to exploit the measured six-fold collection efficiency increase in our system to enhance the signal-to-noise ratio in a Hanbury-Brown Twiss (HBT) interferometer. In an attempt to quantify the far-field optical resolution of our NAIL assisted thermal microscope, we are using a pulsed UV laser to generate a thermal radiation source in Si with a spatial extent less than .5 micrometers. Previously, we experimentally demonstrated an optical resolution of 1.4 micrometers when imaging semiconductor integrated circuits.

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