

Abstract Submitted  
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**A Dual Tip STM for Imaging the Superconducting Phase Difference**<sup>1</sup> ANITA ROYCHOWDHURY, Laboratory for Physical Sciences and Physics Dept., University of Maryland, College Park, M.A. GUBRUD, Department of Physics and Astronomy, University of North Carolina, Chapel Hill, D. SULLIVAN, NASA - Goddard, MICHAEL DREYER, Laboratory for Physical Sciences and Physics Dept., University of Maryland, College Park, J. R. ANDERSON, C.J. LOBB, F.C. WELLSTOOD, Physics Dept., University of Maryland, College Park — We have built a dual tipped millikelvin STM with each tip capable of independently scanning a sample. We will use the STM to measure spatial variations of the gauge-invariant phase difference at the atomic scale. The two tips along with the superconducting sample constitute a SQUID. This configuration is designed to minimize fluctuations in the superconducting phase of one of the tips as it scans the sample, hence inhibiting supercurrent suppression. We are currently developing a technique to fabricate superconducting Niobium tips for use with this system.

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