

Abstract Submitted  
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**Very Large Scale Integration of Nano-patterned  $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$  Josephson Junctions in a Two-dimensional Array**<sup>1</sup> SHANE CYBART, S.M. ANTON, S.M. WU, JOHN CLARKE, R.C. DYNES, Department of Physics, University of California, Berkeley, CA 94720, SQUID TEAM — Very large scale integration of Josephson junctions in a two-dimensional series-parallel array has been achieved by ion irradiating a  $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$  film through slits in a nano-fabricated mask created with electron beam lithography and reactive ion etching. The mask consisted of 15,820 high-aspect ratio (20:1), 35-nm wide slits that restricted the irradiation in the film below to form a 28 x 565 Josephson junction array. Characterizing each parallel segment, containing 28 junctions, with a single critical current we found a standard deviation of about 16%. To study array configuration, the number of SQUIDs connected in parallel was decreased by etching the array with photolithography and ion milling. We compare voltage — magnetic field characteristics for the different configurations and have found that the modulation depth of the voltage has a much stronger than expected dependence on the inductances of the SQUIDs.

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