Abstract Submitted
for the MAR08 Meeting of
The American Physical Society

Measurements of a YBCO superconducting quantum interference filter with planar ion-damaged Josephson junctions. SHANE A. CYBART, S. WU, I. SIDDIQI, JOHN CLARKE, R.C. DYNES, Department of Physics, University of California Berkeley and Material Science Division, Lawrence Berkeley National Laboratory — We have fabricated a superconducting quantum interference filter (SQIF) containing 300 SQUIDS connected in series. Loops in a YBCO film were patterned using photolithography and argon ion milling. The Josephson junction barriers were formed with ion bombardment through 30 nm wide slits that were patterned with electron beam lithography and reactive ion etching of a 25 nm germanium / 800 nm photoresist mask. The ion damage lowered the Tc of the 30 nm unmasked region resulting in SS'S junctions, where supercondconductor S has a Tc of 85 K, and S' of 75 K. The IcRn product for individual junctions was determined to be 0.02 mV from current-voltage characteristics measured at 73K. Voltage versus magnetic field curves were measured for different static bias currents. They show a dip at zero field which increases with increasing bias up to a saturation value of 2 mV. The maximum transfer coefficient was 17 mV/mT. Noise properties and linearity measurements will be presented. This work was supported by AFOSR, and by DOE through the LBNL Molecular Foundry.

Shane Cybart
Department of Physics, University of California Berkeley
and Material Science Division, Lawrence Berkeley National Laboratory

Date submitted: 25 Nov 2007 Electronic form version 1.4