

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Manipulation of half-integer flux quanta¹ C.J.M. VERWIJS, AR-
IANDO, J.A. BOSCHKER, H. HILGENKAMP, Faculty of Science and Technology
and MESA+ Institute for Nanotechnology, University of Twente — Because of the
different pairing symmetry in high- T_c cuprates (d -wave) and low- T_c superconduc-
tors (s -wave) it is possible to realize hybrid superconducting rings with a built-in
 π -phase shift. These rings have a twofold degenerate groundstate characterized by
spontaneously generated circulating currents corresponding to a half flux quantum.
We have realized such rings by connecting the cuprate $\text{YBa}_2\text{Cu}_3\text{O}_{7-\delta}$ to the low- T_c
superconductor Nb via ramp-type Josephson junctions. We present the integration
of π -rings in a superconducting quantum electronics device, a toggle flip-flop, in
which the fractional flux polarity is toggled by applying single flux quantum pulses.
We will also present experiments in which the half flux quanta at the discontinuities
of 0 - π - 0 Josephson corner junctions are manipulated.

¹work done in collaboration with J.R. Kirtley, C.C. Tsuei, T. Ortlepp, O. Mielke,
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Date submitted: 02 Jan 2007

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