

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Quartet formation at (100)/(110) interfaces of d-wave superconductors¹ ARNO KAMPF, University of Augsburg, ARMANDO ALIGIA, Centro Atomico Bariloche, JOCHEN MANNHART, University of Augsburg — Across a faceted (100)/(110) interface between two $d_{x^2-y^2}$ -superconductors the structure of the superconducting order parameter leads to an alternating sign of the local Josephson coupling. Describing the Cooper pair motion along and across the interface by a one-dimensional boson lattice model, we show that a small attractive interaction between the bosons strongly enhances their binding at the interface. As a consequence we propose that electrons tunnel in quartets across an interface with a staggered sequence of 0- and π -junction contacts. We connect this finding to the recently observed $h/4e$ oscillations in bicrystalline (100)/(110) SQUIDS of cuprate superconductors.

¹Work supported by the DFG through SFB 484

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Date submitted: 24 Nov 2005

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