

Abstract Submitted  
for the MAR13 Meeting of  
The American Physical Society

**Evidence for synchronized Andreev reflections in NSN devices<sup>1</sup>**

MARTIN P. STEHNO, DALE J. VAN HARLINGEN, University of Illinois at Urbana-Champaign — In mesoscopic NSN devices, in which a short superconducting region separates two metallic electrodes, the Andreev reflection process may delocalize and couple electron- and hole-states on opposite sides of the superconductor. In addition to such nonlocal (or crossed) Andreev reflections, quasiparticles may also tunnel directly between the electrodes. We have studied nonlocal transport and current correlations in Cu/Al/Cu structures. We observe that the current correlations are symmetric in applied bias and show local minima when the applied voltages at the two contacts are equal in magnitude. This behavior matches theoretical predictions for devices with intermediate interface transparency in which the nonlocal exchange of quasiparticles triggers additional synchronized Andreev reflection events at the two interfaces.

<sup>1</sup>Work supported by the National Science Foundation grant DMR 06-05813

Martin Stehno  
University of Illinois at Urbana-Champaign

Date submitted: 09 Nov 2012

Electronic form version 1.4