Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

Andreev Bound states as a phase sensitive probe of the pairing symmetry of the FeAs superconductors POUYAN GHAEMI, UC Berkeley, FA WANG, ASHVIN VISHWANATH, UC Berkeley & LBNL — A leading contender for the pairing symmetry in the Fe-pnictide high temperature superconductors is extended s-wave s_-, a nodeless state in which the pairing changes sign between Fermi surfaces. Verifying such a pairing symmetry requires a special probe that is sensitive to both phase and magnitude of the order parameter. We show that the sign structure of s_- pairing leads to Andreev bound states at the edge. In the clean limit they only occur when the edge is along the Fe-Fe bond, but not for a diagonal edge. In contrast to d-wave Andreev bound states, they are not at zero energy and, in general, do not produce a zero bias tunneling peak. Consequences for tunneling measurements are derived, within a simplified two band model and also for a more realistic five band model.

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Date submitted: 02 Dec 2008 Electronic form version 1.4