Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Detecting pairing symmetry in Fe-based superconductors: Solitons and proximity patch[1] VICTOR VAKARYUK, Johns Hopkins University, VALENTIN STANEV, Argonne National Laboratory, WEI-CHENG LEE, University of Illinois at Urbana-Champaign, ALEX LEVCHENKO, Michigan State University — We suggest a mechanism which promotes the existence of a phase soliton – topological defect formed in the relative phase of superconducting gaps of a two-band superconductor with s_{+-} type of pairing. This mechanism exploits the proximity effect with a conventional s-wave superconductor which favors the alignment of the phases of the two-band superconductor which, in the case of s_{+-} pairing, are π-shifted in the absence of proximity. In the case of a strong proximity such effect can be used to reduce soliton's energy below the energy of a soliton-free state thus making the soliton thermodynamically stable. Based on this observation we consider an experimental setup, applicable both for stable and metastable solitons, which can be used to distinguish between s_{+-} and s_{++} types of pairing in the iron-based multiband superconductors.

[1]The financial support was provided by the Center of Emergent Superconductivity funded by the U.S. DOE, Award No. DE-AC0298CH1088. W.C.L. acknowledges Roving Postdoc Program sponsored by CES. AL acknowledges support from Michigan State University.

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Date submitted: 07 Nov 2012 Electronic form version 1.4