Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Thermoelectric signatures of time-reversal symmetry breaking states in multiband superconductors MIKHAIL SILAEV, JULIEN GARAUD, EGOR BABAEV, KTH, The Royal Institute of Technology — We demonstrate that superconductors which break time-reversal symmetry can exhibit thermoelectric properties, which are entirely different from the Ginzburg mechanism. As an example, we show that in the s+is superconducting state there is a reversible contribution to thermally induced supercurrent, whose direction is not invariant under time-reversal operation. Moreover in contrast to Ginzburg mechanism it has a singular behavior near the time-reversal symmetry breaking phase transition. A local hot spot in such superconductors is surrounded by a multipolar magnetic field, sensitive to the presence of domain walls and crystalline anisotropy of superconducting states. A non-stationary heating process produces an electric field and a charge imbalance in different bands. These effect can be measured and used to distinguish s+is and s+id superconducting states in the candidate materials such as $Ba_{1-x}K_xFe_2As_2$.

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Date submitted: 23 Nov 2015 Electronic form version 1.4