Abstract Submitted
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Anomalous thermodynamic power laws in nodal superconductors[1] JORGE QUINTANILLA, University of Kent and ISIS Facility, STFC Rutherford Appleton Laboratory, BAYAN MAZIDIAN, University of Bristol and ISIS Facility, STFC Rutherford Appleton Laboratory, JAMES F. ANNETT, University of Bristol, ADRIAN D. HILLIER, ISIS Facility, STFC Rutherford Appleton Laboratory — Unconventional superconductors are frequently identified by the observation of power law behaviour on low temperature thermodynamic properties such as specific heat. These power laws generally derive from the linear spectrum near points or lines of zeros, or nodes, in the superconducting energy gap on the Fermi surface. Here we show that, in addition to the usual point and line nodes, a much wider class of different nodal types can occur. Some of these new types of nodes typically occur when there are transitions between different types of gap node topology, for example when point or line nodes first appear as a function of some physical parameter. We derive anomalous, non-integer thermodynamic power laws associated with these new nodal types and predict their occurrence in iron pnictide superconductors and in the noncentrosymmetric system $Li_2Pd_{3-x}Pt_xB$.

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