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Specific Heat and Resistivity of materials with complex Fermi surface topology DAVID QUESADA, Department of Natural Science, Mathematics, and Computer Science, St. Thomas University, 16401 NW 37 Ave. Miami Gardens, FL 33054 — New families of superconducting materials share a common property; they all have a complex Fermi surface topology. The later is a result of the complex dynamics of carriers in these systems and the layered crystalline structure of most of them. In this paper, the electronic specific heat and resistivity have been computed in the normal and superconducting state for three models of Fermi surface: 1. a tetragonal tight binding dispersion law including second order hopping element, 2. a tetragonal tight binding dispersion law including second order hopping element and interlayer hopping that depends only on plane momentum, and 3. a hexagonal tight binding dispersion law. The effect of the proximity of the Fermi level to the Van Hove singularity is analyzed, as well as its relevance to the phenomenon of superconductivity. The calculations in the superconducting state are done for d-wave symmetry and d+s order parameters. Results are compared with angle resolved specific heat measurements and angle resolved photoemission spectroscopy.

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