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Properties of minimizers of the Lawrence-Doniach energy with perpendicular magnetic field

Abstract. We analyze minimizers of the Lawrence-Doniach energy for layered superconductors occupying a bounded generalized cylinder. For an applied magnetic field in the intermediate regime that is perpendicular to the layers, we prove an asymptotic formula for the minimum Lawrence-Doniach energy as the reciprocal of the Ginzburg-Landau parameter and the interlayer distance tend to zero. Under an appropriate assumption on the relationship between these two parameters, we establish comparison results between the minimum Lawrence-Doniach energy and the minimum 3D anisotropic Ginzburg-Landau energy.