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Tien-Tsan Shieh* (tshieh@math.arizona.edu), Department of Mathematics, University of Arizona, Tucson, AZ 85721. *Γ -limit of the Ginzburg-Landau energy in a thin domain with a large magnetic field.*

A one-dimensional Ginzburg-Landau model, which describes a superconducting closed thin wire with an arbitrary cross-section subject to a large applied magnetic field, is derived from the three-dimensional Ginzburg-Landau energy in the spirit of Γ -convergence. Our result proves the validity of the formal result of Richardson and Rubinstein, which reveals the double limit of a large field and a thin domain. An additional magnetic potential related to the applied field is found in the limiting functional which yields a parabolic background for the oscillatory phase transition curve between the normal and superconducting states. (Received August 06, 2007)