From: **Jorge E. Hirsch** jhirsch@physics.ucsd.edu
Subject: EPL G41974
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To: jhirsch@ucsd.edu

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The author has the long term
fight with the existing theory of superconductivity. In the present manuscript he claims that this well established theory contradicts to the laws of thermodynamics. In particular If we cool a type I superconductor in a magnetic field than the field near the surface will change since the London penetration depth is temperature dependent. The change of magnetic field through the Faraday law produces the electric field that leads to dissipation. This dissipation depends on the cooling speed, and kinetic coefficients. Trying to use the corresponding heat to get the entropy change in this process the authors obtains that the change in entropy is not a function of initial and final states but depends on the speed of cooling and on the normal conductivity. This fact in authors view contradicts to laws of thermodynamics since entropy and energy are functions of state and not of the way the state was prepared.
First I should mention that the authors objections are not really
against the BCS theory of superconductivity and not about superconductivity. There are number of situations where magnetic properties of a metal depend on temperature. Being it ferromagnet, antiferro- or simply para- or diamagnet. Changing temperature of all these materials will lead to a change of magnetic field inside and according to the Faraday law to an electric field and so on... Nothing superconductivity specific. Are all these materials in contradiction with the laws of thermodynamics? I strongly doubt that.
As the authors writes himself the cooling of superconductor is irreversible process due to appearance of this Joule heating. It also would be irreversible in a gedanken
experiment suggested in Fig 3 and in chapter IV of the manuscript since the heat conductance is not a reversible process. For irreversible processes entropy and heat are not directly related. Second law of thermodynamics (Clausius inequality) states that the change of entropy is bigger than the heat divided by temperature. So there is no any contradiction with the laws of thermodynamics. I can not recommend this manuscript for publication.