

Abstract Submitted
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Fluctuation **Nernst-Ettingshausen**
Effect above Ordinary/Quantum Superconducting Transition¹ ANDREI
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Buffalo — A problem of the definition of the heat transported in thermomagnetic
phenomena has been well realized in the late sixties, but not solved up to date. Ignor-
ing this problem, numerous recent theories grossly overestimate the thermomagnetic
coefficients in strongly interacting systems. Here we develop a gauge-invariant mi-
croscopic approach, which shows that the heat transfer should include the energy of
the interaction between electrons and a magnetic field. We also demonstrate that
the surface currents induced by the magnetic field transfer the charge in the Nernst
effect, but do not transfer the heat in the Ettingshausen effect. Only with these two
modifications of the theory, the physically measurable thermomagnetic coefficients
satisfy the Onsager relation. We critically revised the Gaussian fluctuation theory
above the ordinary/quantum superconducting transition and show that the gauge
invariance uniquely relates thermomagnetic phenomena in the Fermi liquid with the
particle-hole asymmetry.

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