

Abstract Submitted
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Dissipationless Nernst effects VADIM OGANESYAN, CSI/CUNY, DORON BERGMAN, Caltech — We develop a theory of transverse thermoelectric (Peltier) conductivity, α_{xy} , in finite magnetic field – this particular conductivity is often the most important contribution to the Nernst thermopower. We demonstrate that α_{xy} of a free electron gas can be expressed purely and exactly as the entropy per carrier irrespective of temperature (which agrees with seminal Hall bar result of Girvin and Jonson). In two dimensions we prove the universality of this result in the presence of disorder which allows explicit demonstration of a number features of interest to experiments on graphene and other two-dimensional materials. We also exploit this relationship in the low field regime and to analyze the rich singularity structure in $\alpha_{xy}(B, T)$ in three dimensions; we discuss its possible experimental implications.

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