

Abstract Submitted  
for the MAR14 Meeting of  
The American Physical Society

**Quantum Theory of Heat Magnetization** ATSUO SHITADE, Dept. of Phys., Kyoto Univ. — We give the thermodynamic definition of the heat magnetization, and calculate with use of the Keldysh formalism in a curved spacetime. As the charge current is coupled to a vector potential, the heat current is coupled to a part of a vielbein. Consequently, as we define the orbital magnetization by a magnetic field, we can define the heat magnetization by a torsional magnetic field induced by a vielbein. Such heat magnetization, together with the Kubo formula for the thermal conductivity calculated by a torsional electric field, leads to the proper thermal Hall conductivity satisfying the Wiedemann-Franz law. Our results indicate that the quantum thermal Hall effect in (2+1)-D time-reversal-broken topological insulators or superconductors is described by the Chern-Simons action of a vielbein.

[1] A. Shitade, arXiv:1310.8043.

[2] A. Shitade, arXiv:1310.8046.

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Date submitted: 06 Nov 2013

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