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The temperature-dependences of the dissipative conductance in quantum Hall states N. D'AMBRUMENIL, University of Warwick, Coventry, CV4 7AL, UK, B.I. HALPERIN, Harvard University, Cambridge, Massachusetts 02138, USA, RUDOLF H. MORF, Paul Scherrer Institute, CH-5232 Villigen, Switzerland — We discuss how to estimate the saddle point gap of quantized Hall states from the temperature dependence of the longitudinal response, $\log \sigma_{xx}$. The dissipative response is assumed to be the result of thermally activated quantum tunneling through saddle points in the long-range impurity potential set up by the ionized donors (see Phys. Rev. Lett. 106, 126804 (2011)). We apply the method to published data on states at $\nu = 5/2$, as well data at other integer and fractional filling fractions, and compare the gap estimates and the typical parameters of the saddle points with expectation from microscopic calculations. Even in the case of very weak quantum Hall states, we find that the analysis suggests saddle point gaps which are consistently around 50% of the gap predicted for the homogeneous system.

[X] Prefer Oral Session
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