Supplementary Information

Probing the mesoscopic size limit of quantum anomalous Hall insulators

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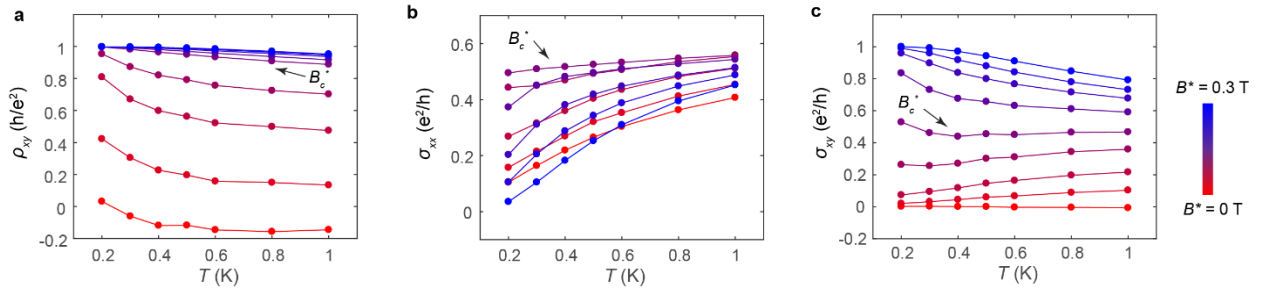
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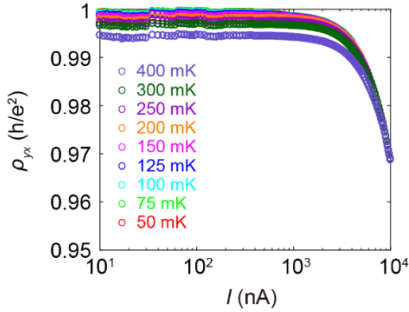
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1. Transport behavior in the $T \to 0$ limit.

Supplementary Figure 1. The limiting transport behavior of ρ_{yx}, σ_{xy}, and σ_{xy} in the $T \to 0$ limit under different B^*. The red, purple (denoted by B_c^*), and blue data represent the QAH, quantum
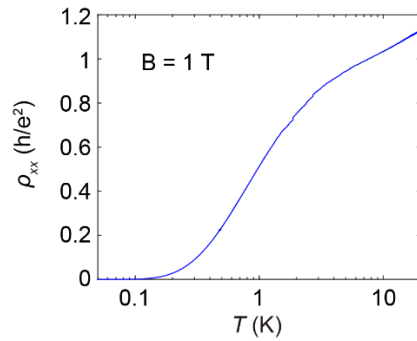
critical, and insulating regimes, respectively.

2. Current dependence of ρ_{yx} in the QAH regime.
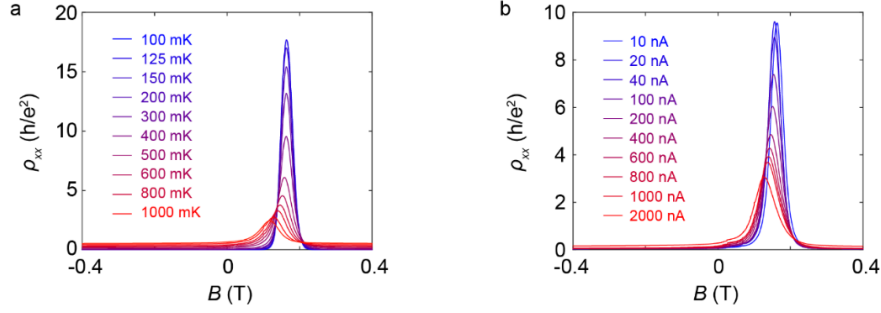

Supplementary Figure 2. Current dependence of ρ_{yx} under different temperatures in the QAH regime. All data are measured under a 1 T magnetic field.

## 3. Temperature dependence of ρ_{xx} in the QAH regime.

Supplementary Figure 3. Temperature dependence of ρ_{xx} under 1 T magnetic field. The curve was measured using a 10 nA excitation current.
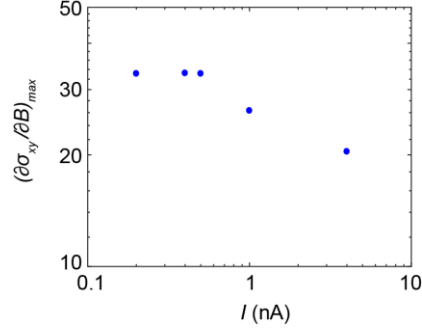
4. Field dependence of ρ_{xx}.

Supplementary Figure 4. a, Field dependence of ρ_{xx} under different temperatures. The field sweeping direction is from negative to positive. All curves are measured under a 10 nA current. **b,** Field dependence of ρ_{xx} under different currents. All curves are measured at 200 mK.

5. Inelastic scattering exponent p in another sample
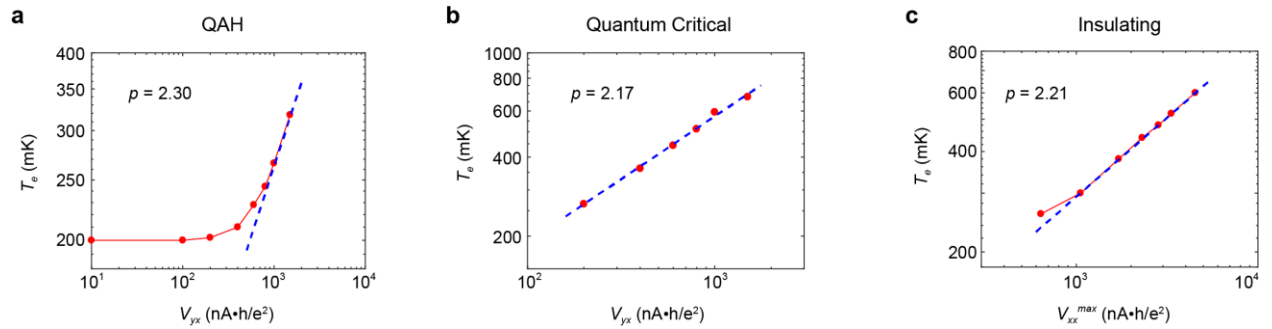
Supplementary Figure 5. Inelastic scattering exponent p obtained in the **a**, QAH, **b**, quantum critical, and **c**, insulating regimes. Although the values are slightly larger than that examined in the main text, the values are comparable for different regimes in this sample.
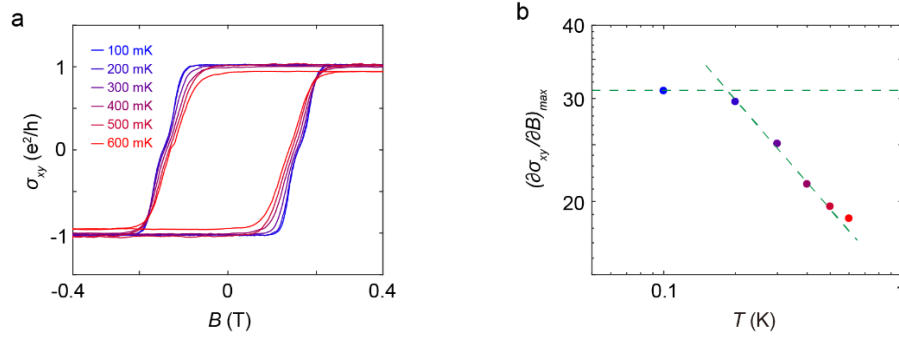
6. Current dependence of $(\partial\sigma_{xy}/\partial B)_{max}$ in the quantum critical regime for the 5-μm-sample

Supplementary Figure 6. Current dependence of $(\partial\sigma_{xy}/\partial B)_{max}$. All data are measured at 100 mK.

The current heating effect is neglectable when I is no larger than 0.5 nA.

7. Finite-size effect in another 5-μm-sample.

Supplementary Figure 7. a, Field dependence of σ_{xy} at different temperatures. **b,** Temperature

dependence of $(\partial\sigma_{xy}/\partial B)_{max}$. For this sample, the saturation temperature is also around 190 mK.