

Abstract Submitted
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Current noise near to the 2D superconductor-insulator quantum critical point ANDREW G. GREEN, University of St Andrews, JOEL E. MOORE, ASHVIN VISHWANATH, UC Berkeley, SHIVAJI L. SONDHI, Princeton University — We consider current fluctuations near to the two-dimensional superconductor-insulator transition described by a quantum XY model. This model displays metallic conductivity at criticality. We consider the system both in thermal equilibrium and when a large electric field drives it far from thermodynamic equilibrium. As the strength of the electric field is increased, we find a crossover from thermal, Johnson-Nyquist noise (whose form is demanded by the fluctuation dissipation relation) to a high-field non-linear “shot noise” or Schwinger regime, where the current noise is proportional to \sqrt{E} . Comparison with noise in diffusive electronic systems and the possible relevance of using noise measurements in experiments on S-I systems will be discussed.

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