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Current and Susceptibility Imaging with Scanning SQUIDs CHRISTOPHER WATSON, KATJA NOWACK, ERIC SPANTON, JOHN KIRTLEY, KATHRYN MOLER, Stanford University — Spatial variations in conductivity and magnetic susceptibility herald both global effects, including the existence of topological phases, and local features, such as those associated with material defects. Recent reports study these phenomena via local imaging of the magnetic field associated with the resultant current distribution, making use of scanning SQUID (Superconducting QUantum Interference Device) microscopy. Here we explore the utility of this technique and the extent to which the spatial resolution may be improved by a reduction of the sensor size and thorough characterization and calibration of the sensor height and point spread function. SQUID current imaging offers a crucial local complement to global transport measurements in exploring the wealth of conductance phenomena present in quantum material systems.

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