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Site-resolved detection of current fluctuations FLORIAN MARQUARDT, STEFAN KESSLER, Institute for Theoretical Physics, University of Erlangen-Nuremberg, Germany — Two recent developments have significantly expanded the toolbox for ultracold atoms in optical lattices: Site-resolved single-atom detection and the generation of artificial gauge fields. We propose a scheme for site-resolved detection of local current operators [arXiv:1309.3890]. This will allow to measure spatial correlations in fluctuating current patterns and the full counting statistics of local currents. We illustrate the possibilities via numerical simulations for interacting systems of ultracold atoms, with and without an artificial magnetic field.

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