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Spin-Resolved Quantum Gas Microscopy with Bilayer Readout PIMONPAN SOMPET, JOANNIS KOEPSELL, SARAH HIRTHE, DOMINIK BOURGUND, GUILLAUME SALOMON, JAYADEV VIJAYAN, IMMANUEL BLOCH, CHRISTIAN GROSS, Max-Planck-Institut fr Quantenoptik — Ultracold atoms in optical lattices with single-site resolved detection has enabled the study of the interplay between charge and spin in strongly correlated systems. Here, we report on a high fidelity of vertically spin-resolved method in our two-dimensional (2D) Fermi-Hubbard systems. To achieve this, we employ the Stern-Gerlach splitting which separates two different spins into two different sublayers of a fully-controllable bichromatic vertical superlattice. For imaging the two layers (or spins), we use geometric charge pumping to increase the distance between the layers, and therefore achieve the single-site-resolution images of individual layers. We benchmark this technique by measuring the spin correlation in our 2D systems and observe strong antiferromagnetic correlations in undoped regime.

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