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Linear response thermometry with ultracold fermionic atoms in an optical lattice DANIEL GREIF, LETICIA TARRUELL, THOMAS UEHLINGER, ROBERT JORDENS, NIELS STROHMAIER, HENNING MORITZ, TILMAN ESSLINGER, ETH Zurich — The low-temperature Fermi-Hubbard model is expected to capture many fascinating phenomena such as d-wave superfluidity. In our experiment we use a repulsive two-component Fermi gas loaded into a 3D optical lattice to realize this simple model Hamiltonian. Currently several experiments are reaching out to achieve even lower temperatures with novel cooling schemes in order to access and characterize the magnetically ordered state. This requires a temperature sensitive probe in the lattice. We show how linear response to weak lattice modulation can be used as a thermometer in the lattice. This can also be employed as a detector for local spin ordering.

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