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Thermometry in a two-component Mott insulator[1] PATRICK MEDLEY, DAVID WELD, HIROKAZU MIYAKE, DAVID HUCUL, DAVID PRITCHARD, WOLFGANG KETTERLE, MIT — Ultracold atoms trapped in optical lattices offer a promising testbed for simulation of many-body Hamiltonians. However, thermometry of atoms in optical lattices remains challenging. One possible solution is to take advantage of the additional degrees of freedom offered by a two-component Mott insulator. We will present the results of experiments involving thermometry and cooling in a Mott insulator of ^{87}Rb atoms comprising a mixture of two different hyperfine states. State-selective polarization rotation imaging can be used in conjunction with a field gradient to directly image the Boltzmann distribution of the spin states.

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