

Abstract Submitted
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Raman sideband cooling of quantum degenerate ${}^6\text{Li}$ AHMED OM-RAN, MARTIN BOLL, TIMON HILKER, KATHARINA KLEINLEIN, GUILLAUME SALOMON, IMMANUEL BLOCH, CHRISTIAN GROSS, Max-Planck-Institut für Quantenoptik, Hans-Kopfermann-Str.1, 85748 Garching, Germany — The ability of single-site resolved detection in optical lattice experiments had huge impact on the study of strongly correlated bosonic systems. In our experiment we plan to apply similar techniques to fermionic ${}^6\text{Li}$. However for strongly correlated fermions there does not yet exist an imaging technique which combines a sufficient ratio of signal to noise while keeping each atom trapped on its original lattice site. In this talk we present our approach, employing Raman sideband cooling. We discuss our progress using a far detuned optical lattice to pin the atomic distribution while performing Raman sideband cooling and simultaneously acquiring fluorescence light for single-atom imaging. We compare this to our results of a near resonant lattice, only 85 GHz detuned with respect to the D_1 transition of ${}^6\text{Li}$.

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