

Abstract Submitted
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Laser cooling of nuclear spin 0 alkali ^{78}Rb ¹ J.A. BEHR, A. GORELOV, TRIUMF, M. ANHOLM, University of Manitoba — The textbook example for sub-Doppler cooling is a $J=1/2$ $I=0$ alkali atom in $\text{lin} \perp \text{lin}$ molasses. In the $\sigma^+ \sigma^-$ configuration of a standard MOT, the main sub-Doppler cooling mechanism relies on changing alignment (M_F^2 population) with the summed linear polarization orientation, but there is no such variation in AC Stark shift for $F=1/2$. We have nevertheless looked for signs of sub-Doppler cooling by trapping $I=0$ ^{78}Rb in a standard MOT and measuring the cloud size as a function of laser detuning and intensity. The ^{78}Rb cloud size does not change significantly with lowered intensity, and expands slightly with detuning, consistent with minimal to no sub-Doppler cooling. Our geometry does show the well-known substantially smaller cloud size with detuning and intensity for $I=3/2$ ^{87}Rb . Maintaining an $I=0$ alkali cloud size with lowered intensity will help our planned β - ν correlation experiments in ^{38m}K decay by suppressing possible production of photoassisted dimers.

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