

Abstract Submitted
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Decoherence of spin oscillations in an ultracold $F=1$ sodium gas

ARNE SCHWETTMANN, HYEWON PECHKIS, JONATHAN WRUBEL, RYAN BARNETT, EITE TIESINGA, PAUL LETT, Joint Quantum Institute, NIST and the University of Maryland — An ultracold $F=1$ sodium gas prepared in a superposition of the $m=+1$, 0 , -1 magnetic sublevels displays nonlinear spin dynamics. The dynamics are driven by coherent spin mixing collisions, where a pair of $m=0$ atoms is converted into a pair with $m=+1$ and $m=-1$. In the noncondensed thermal gas, we find that the resulting population oscillations decay over several hundred milliseconds. We present measurements of the decay time as a function of applied magnetic field and initial state, and discuss possible causes of the decay.

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