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- [63] It is important to realize that the difference in mean-field interactions between the two states, $(a_{22} - a_{11}) \approx 2.6 \text{ \AA}$, is extremely small in ^{87}Rb and is not the mechanism for spin wave propagation. For the purposes of these experiments $(a_{22} - a_{11})$ provides merely a contribution to the inhomogeneity in $\Delta(z)$. The total mean-field effect ω_{exch} is proportional to $a = (a_{11} + a_{22})/2 \approx 50 \text{ \AA}$.

- [64] The mean phase of the Bloch vector evolves at the average hyperfine splitting frequency of $\bar{\Delta} = 6.8$ GHz; the Bloch vector only moves slowly in the frame rotating at $\bar{\Delta}$. It is in this reference frame the effects of spin waves are considered. The local oscillator is set so that the Ramsey fringe frequency is much larger than the spin wave frequency, simplifying analysis of the “instantaneous” phase and amplitude of the Bloch vectors.
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