Abstract Submitted
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Spin waves in a spin-1 normal Bose gas STEFAN NATU, ERICH MUELLER, Cornell University — We present a theory of spin waves in a non-condensed gas of spin-1 bosons: providing both analytic calculations of the linear theory, and full numerical simulations of the nonlinear response. Although the spin-dependent contact interaction is small compared to the thermal energy, it sets the scale for low-energy, long-wavelength spin waves. We find which parameters lead to stable ferromagnetic or nematic order and study the dynamics of any resulting instabilities. For example, we show that ferromagnetic fluctuations render the polar state of ^{87}Rb unstable, even in a thermal gas. We corroborate this result by explicit numerical simulations in a harmonic trap. We also explore coherent population dynamics in a collisionless transversely polarized gas, driven entirely by the spin-dependent contact interaction.

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