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Magnon optics and thermodynamics in a degenerate spinor Bose gas

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At low temperature, spinor Bose gases form magnetically ordered superfluids. Like other magnetic materials, such a fluid supports magnons, the Nambu-Goldstone bosons corresponding to the spontaneous breaking of rotational symmetry. We have developed methods to produce and detect such excitations in a ^{87}Rb $F = 1$ spinor Bose gas. I will discuss precise measurements of the magnon recoil energy using coherent magnon interferometry, the use of thermalized magnons to measure and lower the temperature of quantum gases, and the phenomenon of magnon condensation in a quantum gas.