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Collective excitations in spinor Bose-Einstein condensate G. EDWARD MARTI, RYAN OLF, SEAN LOURETTE, ANDREW MACRAE, DAN STAMPER-KURN, UC Berkeley, Dept. of Physics — The multiple broken symmetries in a ferromagnetic Bose-Einstein condensate lead to two Nambu-Goldstone bosons: a phonon and a magnon. A magnon — a spin impurity excitation — is a gapless mode with a quadratic dispersion relation. We introduce a new spin imaging technique to study the transport and dispersion of weak spin excitations in a $F = 1$ ^{87}Rb spinor condensates. We use this technique to measure the magnon mass, magnetic moment, and energy gap.

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