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Direct, Non-Destructive Imaging of Transverse and Longitudinal Magnetization in a Spin-1 Bose Gas LORRAINE SADLER, JAMES HIGBIE, SHIN INOUYE, University of California, Berkeley, ANANTH CHIKKATUR, Harvard University, SABRINA LESLIE, KEVIN MOORE, University of California, Berkeley, VERONIQUE SAVALLI, DAN STAMPER-KURN, University of California, Berkeley — Polarization-dependent phase contrast imaging is used to image the magnetization of an optically trapped ultracold gas in- situ, nondestructively, and repeatedly. This novel probe is applied to obtain time-resolved images of the Larmor precession of a spin-1 ^{87}Rb Bose-Einstein condensate. The transverse magnetization of the condensate remains consistent with a mean- field model of interatomic interactions. Implications for precise magnetometry with high spatial resolution are discussed.

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