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Digital holographic microscopy for ultracold atoms FRANCISCO SALCES-CARCOBA, CHRISTOPHER BILLINGTON, EMINE ALTUNTAS, YUCHEN YUE, IAN SPIELMAN, Joint Quantum Institute - University of Maryland NIST — We review two technical applications of digital holographic microscopy for imaging ^{87}Rb Bose-Einstein condensates (BECs). First, by recording an off-axis hologram, we refocus the reconstructed object field and study the possibility of recovering nearly diffraction-limited images without modifying the physical setup. Finally, we show that this technique allows direct observation of both the real and imaginary parts of the atomic susceptibility, effectively allowing for continuous tuning between far-detuned imaging methods (e.g. phase contrast) and resonant imaging (e.g. absorption) with no alterations to the systems hardware.

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