

Abstract Submitted
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Feshbach enhanced s -wave scattering of fermions: direct observation with optimized absorption imaging DINA GENKINA, Univ of Maryland-College Park, LAUREN AYCOCK, Univ of Maryland-College Park, Cornell University, BENJAMIN STUHL, HSIN-I LU, National Institute of Standards and Technology, ROSS WILLIAMS, National Physical Laboratory, IAN SPIELMAN, Univ of Maryland-College Park, NIST — We directly measured the normalized s -wave scattering cross-section of ultracold ^{40}K atoms across a magnetic-field Feshbach resonance by colliding pairs of degenerate Fermi gases (DFGs) and imaging the scattered atoms. We extracted the scattered fraction for a range of bias magnetic fields, and measured the resonance location to be $B_0 = 20.206(15)$ mT with width $\Delta = 1.0(5)$ mT. To optimize the signal-to-noise ratio (SNR) of atom number in scattering images, we developed techniques to interpret absorption images in a regime where recoil induced detuning corrections are significant. These imaging techniques are generally applicable to experiments with lighter alkalis that would benefit from maximizing SNR on atom number counting at the expense of spatial imaging resolution.

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