

Abstract Submitted  
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**Homogeneous Fermi Gases in the BEC-BCS Crossover** YUNPENG JI, GABRIEL ASSUMPCAO, Yale University, JERE MAKINEN, Yale University, Yale Quantum Institute, GRANT SCHUMACHER, PHILIP TUCKMAN, FRANKLIN VIVANCO, Yale University, NIR NAVON, Yale University, Yale Quantum Institute — Recently, the realization of homogeneous quantum gases has opened up exciting new playgrounds for studying complex quantum many-body problems. By directly producing gases with a uniform density, we can now avoid many issues associated with the spatial variation of the density of harmonically-trapped gases. We demonstrate the creation of a homogeneous degenerate gas of  ${}^6\text{Li}$  atoms trapped in a cylindrical light box created by a combination of axicons and digital micromirror devices. We will report the measurement of the *in-situ* atomic momentum distributions of the uniform Fermi gas across BEC-BCS crossover, and the study of its expansion dynamics from the uniform box trap.

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