

Abstract Submitted  
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**Speckle Imaging of Spin Fluctuations in a Strongly Interacting Fermi Gas**<sup>1</sup> WUJIE HUANG, CHRISTIAN SANNER, EDWARD J. SU, AVIV KESHET, JONATHON GILLEN, RALF GOMMERS, WOLFGANG KETTERLE, MIT-Harvard Center for Ultracold Atoms, Research Laboratory of Electronics, and Department of Physics, Massachusetts Institute of Technology — Spin fluctuations and density fluctuations are studied for a two-component gas of strongly interacting fermions along the Bose-Einstein condensate-BCS crossover. This is done by in situ imaging of dispersive speckle patterns. Compressibility and magnetic susceptibility are determined from the measured fluctuations through the Fluctuation-Dissipation theorem. This new sensitive method easily resolves a tenfold suppression of spin fluctuations below shot noise due to pairing, and can be applied to novel magnetic phases in optical lattices.

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