Abstract Submitted
for the DAMOP17 Meeting of
The American Physical Society

Spin-imbalance in a 2D Fermi-Hubbard system PETER T. BROWN, DEBAYAN MITRA, ELMER GUARDADO-SANCHEZ, PETER SCHAUSS, STANIMIR S. KONDOV, Princeton University, EHSAN KHATAMI, San Jose State University, THEREZA PAIVA, Instituto de Fisica, Universidade Federal do Rio de Janeiro, NANDINI TRIVEDI, The Ohio State University, DAVID A. HUSE, WASEEM S. BAKR, Princeton University — Understanding the magnetic response of the normal state of the cuprates is considered a key piece in solving the puzzle of their high-temperature superconductivity. A simple model for exploring this physics is a two-dimensional Fermi-Hubbard system in an effective Zeeman field. We investigate this model using site-resolved measurements of a spin-imbalanced Fermi gas in an optical lattice. We observe short-range canted antiferromagnetism at half-filling with stronger spin correlations in the direction orthogonal to the magnetization. Away from half-filling, the polarization of the gas exhibits non-monotonic behavior with doping for strong interactions, resembling the behavior of the magnetic susceptibility in the cuprates. The realization of lattice Fermi gases with spin imbalance opens the door to studying exotic superconductivity in large magnetic fields.

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Date submitted: 25 Jan 2017 Electronic form version 1.4