Abstract Submitted
for the DAMOP19 Meeting of
The American Physical Society

Spin-Energy Correlation in Degenerate Weakly-Interacting Fermi Gases[1] SAEED PEGAHAN, ILYA ARAKELYAN, JOHN THOMAS, North Carolina State University, JET LAB TEAM — Very weakly interacting Fermi gases offer a new paradigm for exploring the interplay between spin, motion, Fermi statistics, and interactions in many-body systems. We study the formation of spin-energy correlations in a very weakly interacting Fermi gas of ^{6}Li contained in an optical trap with a spin-dependent potential. Measuring time dependent spin density profiles for coherently prepared, quantum degenerate clouds of ^{6}Li, we find that the profiles are in very good agreement with a one-dimensional mean field description for small s-wave scattering lengths, where the energy changing collision rate is negligible. For temperatures in the classical Boltzmann regime, we observe a modified spin density patterns arising from the energy dependence of the scattering length and measure the zero crossing shift in the scattering length.

[1]Office of Science, U.S. Department of Energy, Physics division of the Army research office

Saeed Pegahan
North Carolina State University

Date submitted: 25 Jan 2019 Electronic form version 1.4