

Abstract Submitted
for the MAR09 Meeting of
The American Physical Society

**Probing quasiparticle dispersion and order parameter symmetry
of ultracold fermionic superfluids and density waves via lattice** DAVID
PEKKER, RAJDEEP SENSARMA, EUGENE DEMLER, Harvard University —

We propose a pump-probe experiment for studying the properties of condensed states of ultracold fermionic atoms in optical lattices. The pump consists of periodic modulations of the optical lattice intensity in time and the probe of measuring either the momentum distribution function or the density-density correlation functions. We apply our scheme to probing d-wave superfluids and d-density waves. In both cases we show that the dispersion relation of quasi-particles can be extracted from the momentum distribution function, and the order-parameter symmetry can be extracted from the pattern of peaks and dips that form due to the interference of the excited quasiparticles in the appropriate density-density correlation function.

David Pekker
Harvard University

Date submitted: 21 Nov 2008

Electronic form version 1.4