

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Phase sensitive measurements of order parameters for ultracold atoms through two particles interferometry¹ TAKUYA KITAGAWA, Physics Department, Harvard University, Cambridge, MA 02138, USA, ALAIN ASPECT, Laboratoire Charles Fabry de l'Institut d'Optique, CNRS, Avenue Augustin Fresnel, 91127 Palaiseau cedex, France, MARCUS GREINER, EUGENE DEMLER, Physics Department, Harvard University, Cambridge, MA 02138, USA — Nontrivial symmetry of the pair wave function is crucial to some of the most interesting states of ultracold atoms, including p-wave Feshbach molecules and d-wave paired states of fermions in optical lattices. Identifying these states in experiments requires measurements of the relative phase of different components of the pair wave function. We discuss a new method for such measurements based on two photon interference and noise correlations analysis in the time of flight experiments. Furthermore, in order to unambiguously determine the symmetry of the wave functions, we propose the method analogous to classical white fringe, which can reveal the existence of fundamental phase factors.

¹NSF grant DMR-0705472, Harvard MIT CUA, DARPA OLE program, MURI

Takuya Kitagawa
Physics Department, Harvard University, Cambridge, MA 02138, USA

Date submitted: 19 Nov 2009

Electronic form version 1.4