

Abstract Submitted
for the DAMOP19 Meeting of
The American Physical Society

Manipulating fermionic superfluids with arbitrary optical potentials GIULIA DEL PACE, WOJIN KWON, RICCARDO PANZA, MASSIMO INGUSCIO, FRANCESCO SCAZZA, GIACOMO ROATI, University of Florence and LENS — We report on our recent experimental results on manipulating fermionic superfluids with arbitrary optical potentials, realized by the combination of a high-resolution imaging and a Digital Micromirror Device (DMD). In particular, we demonstrate a new fully DMD-based technique that allows us to manipulate the phase of fermionic superfluids prepared in a Josephson-like geometry. We can dynamically control the relative phase between the two superfluid reservoirs by illuminating one of them with an appropriate homogeneous pattern of light. The imprinted phase is characterized by studying the interference fringes after a time of flight expansion and we find a monotonic behavior of the imprinted phase as a function of the pulse parameter. Moreover, we studied DC Josephson effect when a constant and homogeneous light shift is imprinted to one of the two reservoirs, finding that the oscillation frequency of the system is proportional to the applied light shift.

Giulia Del Pace
University of Florence

Date submitted: 01 Feb 2019

Electronic form version 1.4