

Abstract Submitted  
for the MAR13 Meeting of  
The American Physical Society

**Ultra-cold fermions in the flatland: evolution from BCS to Bose superfluidity in two-dimensions with spin-orbit and Zeeman fields<sup>1</sup>** LI HAN, CARLOS SA DE MELO, Georgia Institute of Technology — We discuss the evolution from BCS to Bose superfluidity for ultracold fermions in two-dimensions and in the presence of simultaneous spin-orbit and Zeeman fields. We analyze several thermodynamic properties to characterize different superfluid phases including pressure, compressibility, induced polarization, and spin susceptibility. Furthermore, we compute the momentum distribution and construct topological invariants for each of the superfluid phases.

<sup>1</sup>We thank ARO (Contract No. W911NF-09-1-0220) for support.

Li Han  
Georgia Institute of Technology

Date submitted: 09 Nov 2012

Electronic form version 1.4