

Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Effects of disorder on a two-dimensional ultracold gas in BCS-BEC crossover¹ B. TANATAR, A. KHAN, Bilkent University, Department of Physics, 06800 Ankara, Turkey — We investigate the effect of static impurities in a two-dimensional ultracold atomic gas as a function of two-body bound state energy. We incorporate disorder from impurities through fluctuations and study its effects on the BCS-BEC crossover. The analysis on the quasi-homogeneous system reveals depletion of energy gap on the BCS and BEC sides according to the usual expectation but interestingly in the intermediate region (moderate binding energy or crossover), the pairing gap turns out to be same as its clean Fermi gas limit. This motivates us to study the density of states (DOS) and spectral gap, which suggest that the effect of disorder is smallest in this region.

¹Supported by TUBITAK (112T176) and TUBA.

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Date submitted: 14 Nov 2013

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