

Abstract Submitted  
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**Trapped Fermi Gases in Rotating Optical Lattices: Realization and Detection of the Topological Hofstadter Insulator** MEHMET OKTEL, Department of Physics, Bilkent University, 06800, Ankara Turkey, HUI ZHAI, Department Of Physics, University of California, Berkeley, California, 94720, USA, ONUR UMUCALILAR, Department of Physics, Bilkent University, 06800, Ankara, Turkey — We consider a gas of non-interacting spinless fermions in a rotating optical lattice and calculate the density profile of the gas in an external confinement potential. The density profile exhibits distinct plateaus, which correspond to gaps in the single particle spectrum known as the Hofstadter butterfly. The plateaus result from insulating behavior whenever the Fermi energy lies within a gap. We discuss the necessary conditions to realize the Hofstadter insulator in a cold atom setup and show how the quantized Hall conductance can be measured from density profiles using the Streda formula.

Mehmet Oktel  
Bilkent University, Ankara, Turkey

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