Abstract Submitted
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Static and dynamical properties of topological Fulde-Ferrell states in spin-orbit-coupled Fermi gases[1] LEI JIANG, EITE TIESINGA, Joint Quantum Institute, University of Maryland and NIST, XIA-JI LIU, HUI HU, Swinburne University of Technology, HAN PU, Rice University — Motivated by recent experimental breakthroughs in generating spin-orbit coupling in ultracold Fermi gases using Raman beams, we present a systematic study of spin-orbit-coupled Fermi gases in the presence of an in-plane Zeeman field (which can be realized using a finite two-photon Raman detuning). We find that a topological Fulde-Ferrell state with finite-momentum Cooper pairing will emerge in a one-dimensional harmonic trap. The topological nature of the system is manifested by the Majorana modes localized near the trap edges. We investigate the dynamics of the system by solving the time-dependent Bogoliubov-de Gennes equations. We will explore the possibility of exploiting the dynamical properties to probe the topological phase.

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