

Abstract Submitted  
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**Sharma and Fulde-Farrell-Larkin-Ovchinnikov states in an optical lattice** ZLATKO KOINOV, Department of Physics & Astronomy, UTSA, San Antonio, TX, USA, RAFAEL PEREZ, MAURICIO FORTES, Institute of Physics, UNAM, Mexico — We study an imbalance mixture of atomic Fermi gas of two hyperfine states loaded into an optical lattice. We solve the self-consistent equations for the filling factors and the gap equation to investigate the existence of Sharma and Fulde-Farrell-Larkin-Ovchinnikov (FFLO) superfluid states assuming a contact interaction between the atoms (Hubard model). The order parameter in the case of Fulde-Farrell-Larkin-Ovchinnikov (FFLO) superfluid is chosen to be  $\Delta_{\mathbf{q}} = \Delta_0 \exp(i\mathbf{q}\cdot\mathbf{r})$ , where  $2\mathbf{q}$  is the pair momentum in a single plane wave FFLO state.

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