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 \( \Delta_q = \Delta_0 \exp(iq.r) \), where \( 2q \) is the pair momentum in a single plane wave FFLO state.