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The ground state properties of two-component ultra-cold Fermi gas in hard wall confinement BO-BO WEI, Department of Physics and Institute of Theoretical Physics, The Chinese University of Hong Kong, Shatin, NT, Hong Kong, China, JUN-PENG CAO, Institute of Physics and Laboratory of Condensed Matter Physics, The Chinese Academy of Sciences, China, SHI-JIAN GU, HAI-QING LIN, Department of Physics and Institute of Theoretical Physics, The Chinese University of Hong Kong, Shatin, NT, Hong Kong, China — We investigate the ground state properties of a one-dimensional two-component ultra-cold Fermi gas subjected to a hard wall trap. The explicit form of the wave function is obtained by solving the Bethe Ansatz equations numerically. Then we obtain the one-body density matrix of the system for different interaction strengths. Results of the momentum distribution of the atoms, which are obtained from the Fourier transform of the one-body density matrix, are reported for different interaction strengths. This interacting system may be experimentally accessible using ultra-cold atoms.

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