

Abstract Submitted
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Superfluidity and Mott transitions of repulsively interacting three-component fermionic atoms in an optical lattice KENSUKE INABA, NTT BasicResearch Labs., SEI-ICHIRO SUGA, University of Hyogo — We investigated the superfluidity and the Mott transition of repulsively interacting three-component (color) fermionic atoms in an optical lattice [1]. We found that the characteristic Mott transition occurs even at non-integer half filling, when the interaction strengths are strongly anisotropic: the atoms of two of the three colors form the pair to avoid the strongest interaction; as a result, the paired Mott transition occurs because of the effective filling being an integer. We found that a superfluid state appears close to the Mott phase, because the effective attractive interaction is mediated by the density fluctuations of the unpaired atoms. We will discuss the analogical superfluidity and Mott transitions seen in condensed matter.

[1] K. Inaba and S. Suga, Phys. Rev. Lett. 108, 255301 (2012).

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