

Abstract Submitted
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Superfluidity in a three component Fermi gas in a harmonic trap TOMI PAANANEN¹, JANI-PETRI MARTIKAINEN, Division of Theoretical Physics, P.O.B 64, FIN-40014 University of Helsinki, Finland, PÄIVI TÖRMÄ, Nanoscience Center, P.O.B 35, FIN-40014 University of Jyväskylä, Finland — Superfluidity in a two component Fermi gas has been very recently achieved experimentally. However, a three component Fermi gas is also experimentally realistic in the very near future and has, until now, achieved only scant attention. We study ultracold three component Fermi gas in a harmonic trap. Components are different fermionic alkali atoms and they interact through s-wave interactions. There can be several different superfluid phases in the trap. These phases correspond to different pairing channels in the three component system. We show that these different phases can co-exist in a trap. Furthermore, by calculating the Gorkov correction caused by the induced interactions, we show that the many-body corrections to the mean-field theory are more pronounced for unequal mass fermion mixtures

¹Martikainen

Tomi Paananen
Division of Theoretical Physics, University of Helsinki, Helsinki, Finland

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