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Single impurity in cold Fermi superfluids[1] LEI JIANG, HAN PU, Department of Physics and Astronomy, Rice University — Although non-magnetic impurities do not change macroscopic properties of the system in s-wave superfluids, the microscopic local properties will change such as local density of states. Spatially resolved radio frequency spectroscopy gives us a tool to detect local properties of ultracold Fermi superfluids and hence can be used to investigate the effects of impurities. Here we study these local properties of Fermi superfluids with a single impurity. We calculate the radio frequency spectrum using the T-matrix formalism. This impurity can be either potential scattering or scattering with other atoms; either magnetic or non-magnetic. There may exist bound or anti-bound states near the impurity site. We may use single impurity to detect Fermi pairing in radio frequency spectrum in population balanced system. We also compare magnetic impurity spectra with non-magnetic ones.

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