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Universal features of strongly polarized mass imbalanced fermi gases[1] CHARLES MATHY, ITAMP, Harvard-Smithsonian Center for Astrophysics, MEERA PARISH, Cavendish Laboratory, University of Cambridge, DAVID HUSE, Department of Physics, Princeton University — I will discuss the universal phase diagram of strongly polarized two-component fermi gases as a function of mass imbalance r between the two species. Concretely, I will describe the ground state of a single "spin- down" impurity atom interacting attractively with a "spin-up" atomic Fermi gas. By constructing variational wave functions for polarons, molecules and trimers, we performed a detailed study of the transitions between each of these dressed bound states as a function of mass ratio and interaction strength. We found that the presence of a Fermi sea enhances the stability of the p-wave trimer, which can be viewed as a Fulde-Ferrell-Larkin- Ovchinnikov (FFLO) molecule that has bound an additional majority atom. For sufficiently large r, the transitions lie outside the region of phase separation in imbalanced Fermi gases and should thus be observable in experiment, unlike the well- studied equal-mass case.

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