

Abstract Submitted
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Polarons, molecules and trimers in spin-polarized fermi gases

CHARLES MATHY, Princeton University, MEERA PARISH, Cambridge University, DAVID HUSE, Princeton University — We consider the problem of a single spin-down impurity atom interacting with a spin-polarized atomic Fermi gas. By constructing variational wavefunctions for polarons, molecules and trimers, we perform a detailed study of the various quantum phase transitions as a function of mass imbalance and interaction strength. Furthermore, we obtain an accurate characterization of the Fulde-Ferrell superfluid region in this limit by allowing the center-of-mass momentum of the molecule to be non-zero. We detail what our results imply for the phase diagram for general mass imbalance, and make experimental predictions on how to see the physics we are describing.

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