Fermi liquid description of a p-wave Fermi gas

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2019年7月4日(周四) 下午15:30
新波谱楼M楼10楼1016-17报告厅

About the speaker:

Dr. Shi-Zhong Zhang is currently an associate professor in Department of Physics, the University of Hong Kong.He graduated from Tsinghua University in 2003, and received his PhD degree in physics from University of Illinois at Urbana-Champaign in 2009.He then did postdoc research in the Ohio State University.He joined the University of Hong Kong in August 2012.His research interest lies in theoretical condensed matter and cold atom physics.For his excellent contributions in these research fields, he was awarded the 2015 Croucher Innovation Awards (The Croucher Foundation, Hong Kong) and the 2017 Outstanding Young Researcher Award, HKU.

Abstract:

We study the Fermi liquid properties of a single component Fermi gas with p-wave interaction. In the weak repulsive limit, we obtain exact perturbative expansions for the ground state energy, the chemical potential and the effective mass of the Landau quasi-particle up to second order in scattering volume. We also calculated the corresponding Landau functions and Landau parameters and show that they satisfy the general Fermi liquid identities. Using Landau transport equation, we show that undamped zero sound only appears in the second order in scattering volume, in contrast to the s-wave case.