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Onset of a Pseudogap Regime in Ultracold Fermi Gases¹

AUREL BULGAC, University of Washington

We show, using an ab initio approach based on Quantum Monte Carlo technique, that the pseudogap regime emerges in ultracold Fermi gases close to the unitary point. We locate the onset of this regime at a value of the interaction strength slightly to the BCS side of the unitary point. We determine the evolution of the gap as a function of temperature and interaction strength in the Fermi gas around the unitary limit and show that our results exhibit a remarkable agreement with the recent wave-vector resolved radio frequency spectroscopy data. Our results indicate that a finite temperature structure of the Fermi gas around unitarity is complicated and involves the presence of preformed Cooper pairs, which however do not contribute to the long range order.

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