Exact renormalisation group and many fermion systems

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We study the exact renormalisation group approach based on the evolution of the effective action as a function of some scale parameter applied to the many fermion system with attraction. The regulator is introduced which acts as a infrared cutoff. The evolution of the system starts from some free action and evolves down to the scale where the system undergoes phase transition and forms the energy gap. The transition point is determined by the strength of fermion-fermion interaction in vacuum. The low density limit is recovered. We estimate the value of the gap as the function of the density and outline the directions of some future investigations.

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