Poster 11

Effects of (non)-magnetic disorder in quasi-1D singlet superconductors

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We investigate the effects of the combination of interactions and disorder in a quasi 1D system. In this case, the critical temperature of superconductivity is an interesting observable for this purpose. Anderson's theorem indeed states that BCS-type superconductivity is resistant to non-magnetic disorder because time-reversal invariance is still preserved [1–3]. In quasi-1D systems, since there the effect of disorder and interactions is more important than in higher dimensional systems (Anderson localization), the Anderson theorem is not respected [4].

We here study the competition between disorder and interactions in such systems by considering forward scattering disorder, both for magnetic and non-magnetic impurities. Using a field theory representation and renormalization, we show that non magnetic disorder preserves T_c in agreement with Anderson theorem. However, for the magnetic disorder, we find a reduction of the spin-gap and compute the reduction of T_c. We investigate the consequences for systems made of fermionic tubes with attractive interactions.

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