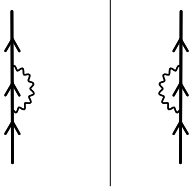
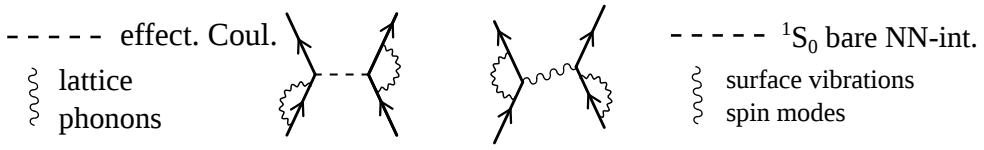
Metals | Nuclei



dressed

electrons (m=0.5 MeV) | nucleons (m=10^3 MeV)



spontaneous breaking of gauge symmetry

$$\left(U'_\nu + V'_\nu e^{-2i\phi} a^\dagger_\nu a^\dagger_{\bar{\nu}}\right)|0\rangle$$

independent pair motion

$\xi\,(\xi/d)$

10^4 Å(10^4) | 20 fm (5)

overlapping pairs 10^6 | number of pairs 8

$\Delta(\Delta/\epsilon_F)$

$\approx$ 1 meV (10^{-4}) | $\approx$ 1 MeV (10^{-2})

generalized quantality parameter

$$q_\xi = \frac{\hbar^2}{2m\xi^2}\frac{1}{\Delta}$$

10^{-5} | 10^{-2}

probing of gauge deformation

$P_1=10^{-10}$

observation of supercurrents between two weakly coupled supercondeuctors (barrier) which only allows for normal single electron tunneling of 2e carriers (Josephson effect)

$P_1=10^{-3}$

Single Cooper pair tunneling mainly as successive transfer between member of a pairing rotational band fulfilling

$$\frac{\sigma(gs(N) \to gs(N+2))}{\sum_{exc}\sigma(gs(N) \to 0^+_{exc}(N+2))} \gg 1$$

$$N = N_0, N_0+2, N_0+4 \ldots N_0+14 \ldots (N_0 = 10)$$

$P_2=P_1$