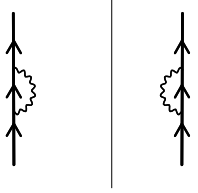
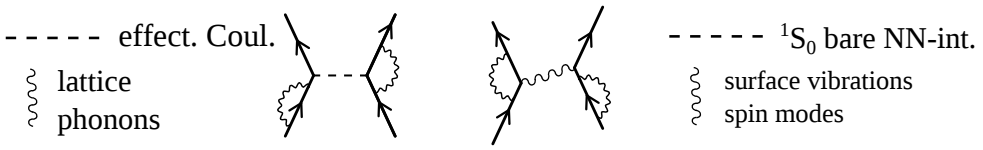
Metals | Nuclei



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) | 14 fm (7)

overlapping pairs 10^6 | number of pairs 6

$\Delta(\Delta/\epsilon_F)$

$\approx$ 1 meV (10^{-4}) | $\approx$ 1.2 MeV (10^{-2})

generalized quantality parameter

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

10^{-5} | 10^{-1}

probing of gauge deformation with single

-electron tunneling | -nucleon transfer

$P_1=10^{-10}$ | $P_1=10^{-3}$

one observes

supercurrents of 2e carriers (Josephson effect) | single Cooper pair tunneling between members of a pairing rotational band satisfying

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

fulfilling

$P_2 \approx P_1$ $\quad (\sigma_1 \approx \sigma_2)$