Vibrations (ph) (pp), (hh)

correlated excitations (E_{corr})

$$\beta = 0$$
 $\beta = \pm 2$ waves on

correlation length

$$\xi = \frac{\hbar v_F}{\pi |E_{corr}|}$$

typical values (finite nuclei), E_{corr} =-2.0 MeV (-0.5 MeV, 11 Li), $v_F/c \approx 0.27~(0.16,~^{11}$ Li)

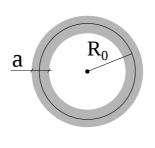
$$\xi = 14 \text{ fm } (20 \text{ fm}, {}^{11}\text{Li})$$

generalized quantality parameter

$$q_{\xi} = \frac{\hbar^2}{2m\xi^2} \frac{1}{|E_{corr}|} \approx 0.05 \quad (0.1,^{11} \text{Li})$$

strongly correlated ($q_{\xi} \ll 1$), weakly "bound" ($|E_{corr}|/\epsilon_F \lesssim 0.06$) very extended $(\xi/d \gtrsim 7, d = \left(\frac{4\pi R^3}{3A}\right)^{1/3})$ objects

subject to a strong external field



example

$$|$$
²²³Ra \rightarrow ¹⁴C+²⁰⁹Pb ($\lambda = PfT$)

$$P = \begin{cases} 10^{-76} & (\Delta = 0) \\ 10^{-10} & \Delta_{exp} \end{cases}$$

$$\langle r^2 \rangle_{def}^{1/2} = \xi = \frac{\hbar v_F}{\pi |E_{corr}|} \approx 29 \text{ fm}$$

 $(E_{corr} \approx 0.6 \text{ MeV})$

$$\langle r^2 \rangle_{Cooper}^{1/2} = \xi = \frac{\hbar v_F}{\pi \Delta} \approx 21 \text{ fm}$$

$$(\Delta \approx 0.8 \text{ MeV})$$