with

$$R_{eff}(^{11}Li) = \left(\frac{9}{11} R_0^2(^9Li) + \frac{2}{11}\left(\frac{\xi}{2}\right)^2\right),$$

where

$$R_0(^9Li) = 2.5\,fm$$

is the ^9Li radius ($R_0 = r_0 A^{1/3}$, $r_0 = 1.2\,fm$), where ξ is the correlation length of the Cooper pair neutron halo. An estimate of this quantity is provided by the relation

$$\xi = \frac{\hbar v_F}{2 E_{corr}} \approx 20\,fm,$$

in keeping with the fact that in ^{11}Li, $(v_F/c) \approx 0.1$ and $E_{corr} \approx 0.5$ MeV. Consequently, $\langle r^2\rangle^{1/2}_{^{11}Li} \approx 3.74\,fm$ ($R_{eff}(^{11}Li) \approx 4.83\,fm$), in overall agreement with the experimental value $\langle r^2\rangle^{1/2}_{^{11}Li} = 3.55 \pm 0.1\,fm$ (Kobayashi et al., 1989).

We now proceed to the calculation of the centroid of the dipole pygmy resonance of ^{11}Li. Making use of the dispersion relation given in Eq. (3.30) p. 55 of Bortignon et al, 1998, and of the fact that $\varepsilon_{p_{1/2}} - \varepsilon_{s_{1/2}} = \varepsilon_{p_{1/2}} - \varepsilon_{s_{1/2}} \approx 0.5$ MeV (see Fig. 11.1 p. 264 Brink and Broglia (2010)),

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