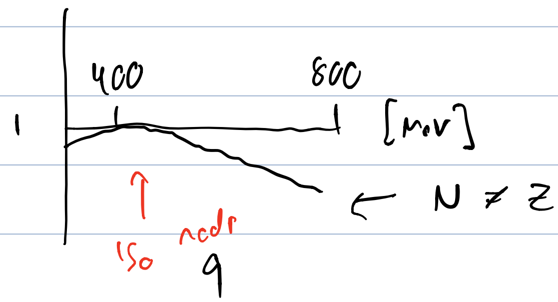
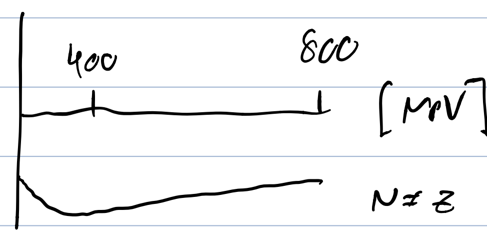
* Trying to understand behavior of $\Lambda_A^{\tau\tau'}(q, \vec{Q}=0)$

ratios $\frac{\rho_p + \rho_n}{n_n + n_p}$ with and without P-waves.

For S-waves only



For S- and P-waves



S-waves only

$$R \sim \frac{\int dk\, {}^1S_0(k,q)^2\, \Theta_p + \int dk \left[\frac{1}{4}\,{}^1S_0(k,q)^2 + \frac{3}{4}\,{}^3S_1(k,q)^2\right]\Theta_p}{\int dk\, {}^1S_0(k,q)^2\, \Theta_n + \int dk \left[\frac{1}{4}\,{}^1S_0(k,q)^2 + \frac{3}{4}\,{}^3S_1(k,q)^2\right]\Theta_p}$$

At $q = 400$ MeV : ${}^1S_0 = 0 \Rightarrow$ ratio is

$$\frac{\int dk\, {}^3S_1(k,q)^2}{\int dk\, {}^3S_1(k,q)^2} = 1 \quad \checkmark$$

S- and P-waves

$^3P_0$, $^3P_1$, $^3P_2-{}^3P_2$ contribute to pp and pn
$^1P_1$ additionally for pn

at $q = 400$ MeV
Compare pp/nn: Instead of being $\frac{\Theta}{\Theta}$ it's now

$$\frac{\int dk \left[{}^3P_0(k,q)^2 + {}^3P_1(k,q)^2 + {}^3P_2(k,q)^2\right]\Theta_p}{\int dk \left[{}^3P_0(k,q)^2 + {}^3P_1(k,q)^2 + {}^3P_2(k,q)^2\right]\Theta_n} \sim \frac{\int dk\, \Theta_p}{\int dk\, \Theta_n}$$

$\int dk$ goes to higher k because of k_F^n in the denominator $\Rightarrow$ ratio < 1