Comparing data and calculations for the np/pp ratio

We are working on comparing our (e,e'pn)/(e,e'pp) data with the theoretical calculation made by Wiringa et al.

Fig 1 below presents our result compared with the Wiringa calculatios published in PRC 78, 021001 (2008). This graph was already presented.

Fig 1:

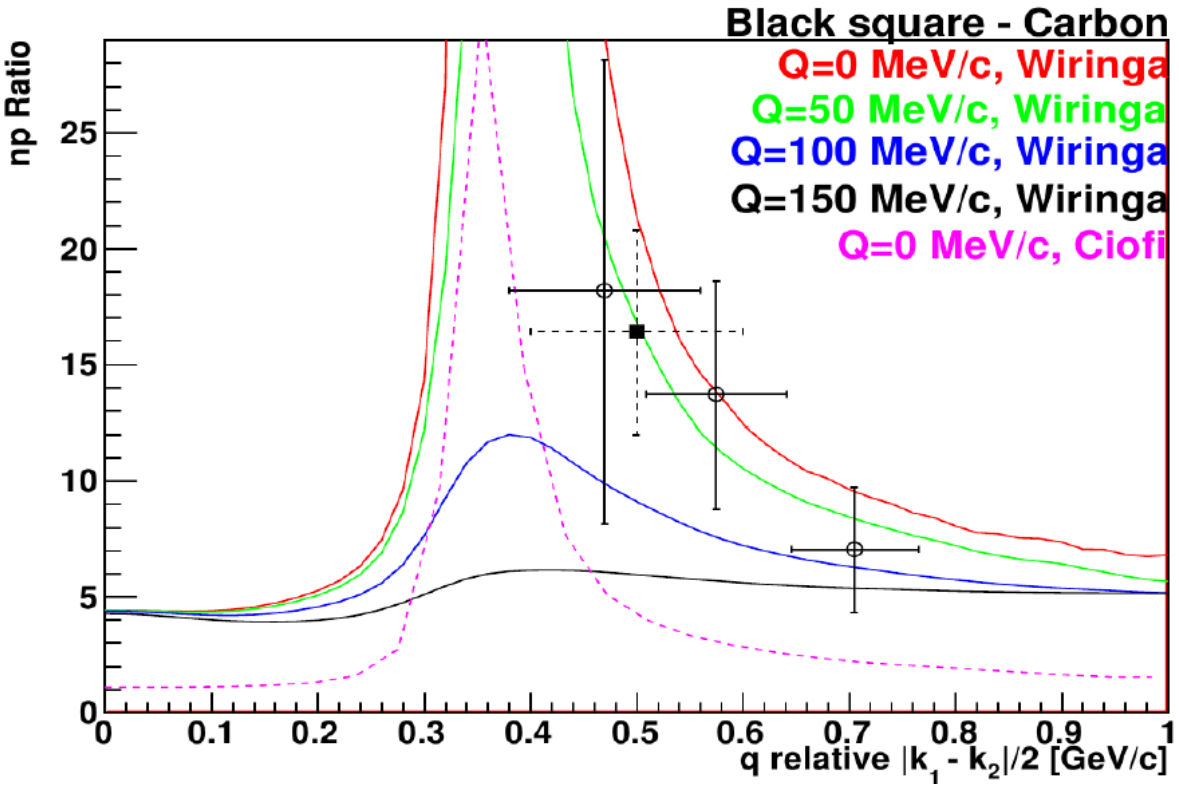

Fig 1: (e,e'pn)/(e,e'pp) compared with Wiringa and Ciofi calculations.

However we have two problems in Fig 1 :

1) Definition of the relative momentum q is problematic form our data because of the FSI. The observable we can determined experimentally is Pmiss.

2) The calculation is done for fixed Q, and for the parallel kinematics Q || q. This is not how our data was taken.

We asked Wiringa for the ratio to be calculated in an isotropic case, i.e the opening angle between Q and q is distributed isotropically.

In for this case his calculations the result are shown in Fig 2:

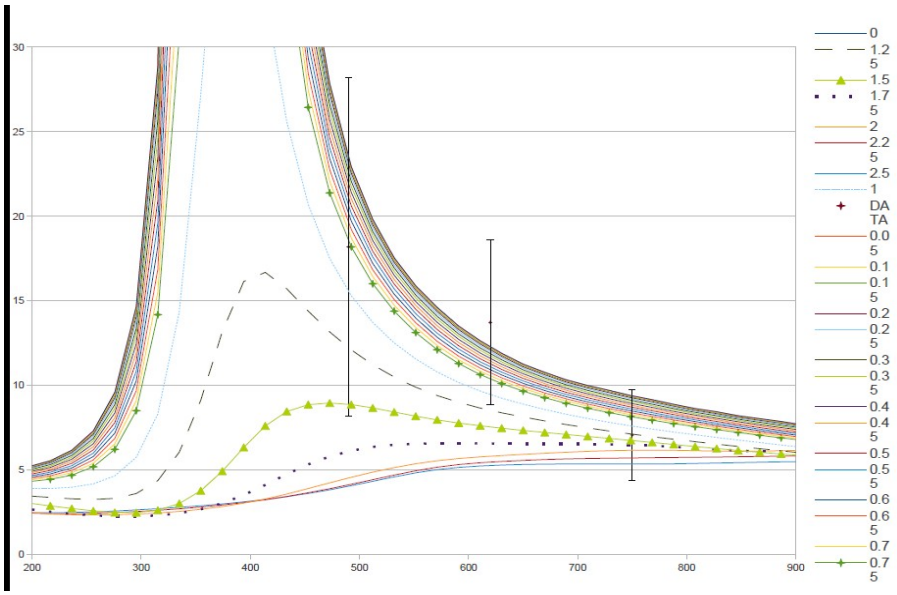

Fig 2: Each line represents different values for Q. In the beginning we have 0.05 fm^{-1} steps up to 0.75 and afterward by 0.25 fm^{-1} steps.

Notice, the data is vs Pmiss and the theory is vs q.

However, our kinematics is probably something in between. Because of the limited statistics and a problem in finding the relative momenta q we can’t determine exactly if we look on parallel or isotropic case.

Extracting the opening angle between Q and “q” from our data ignoring FSI is presented on fig 3:

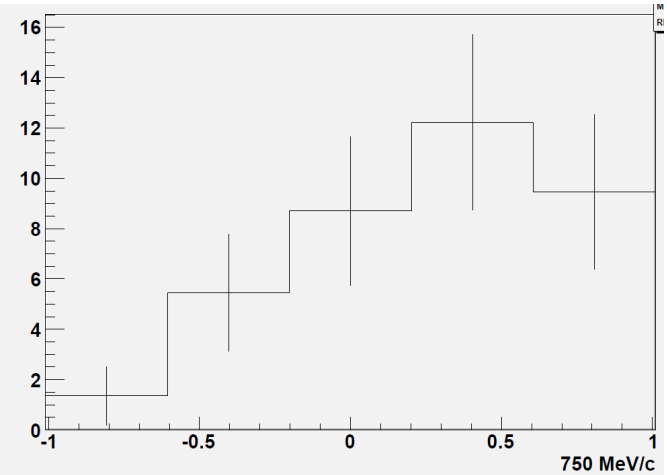

Fig 3: Opening angle between Q and “q” in 750 MeV/c kinematics.

From the experimental data we can only determine the Q distribution. It’s equal to Gaussian distribution of each axis Qx, Qy and Qz by 100 +- 20 MeV/c. This means that the Q distribution is presented on figure 4:

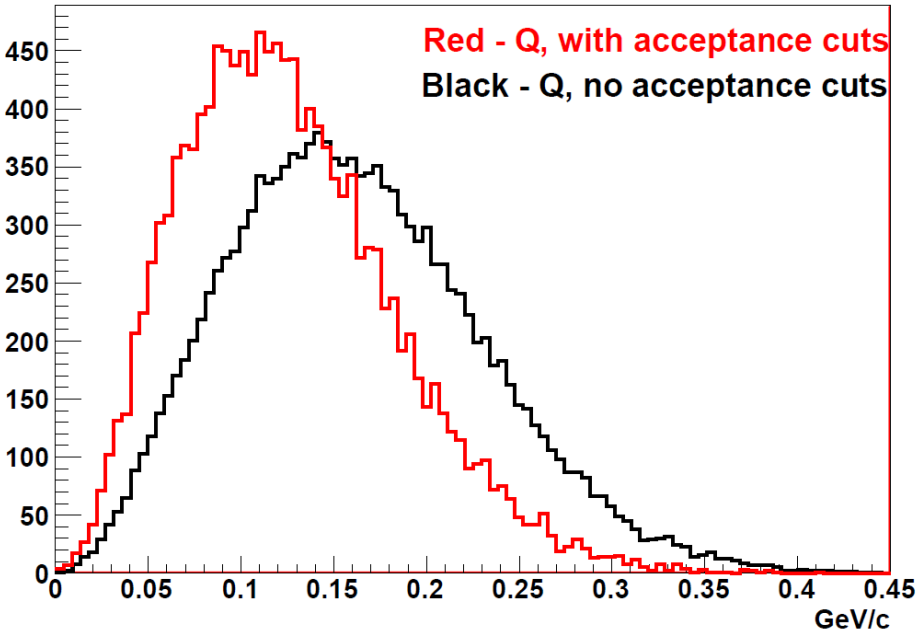

Fig 4: Q distribution with sigma of 100 MeV/c for each axis

So, we need to look on the difference between the parallel and isotropic case. For ~ 100 MeV/c kinematics and it’s comparison to the data is shown on fig 5:

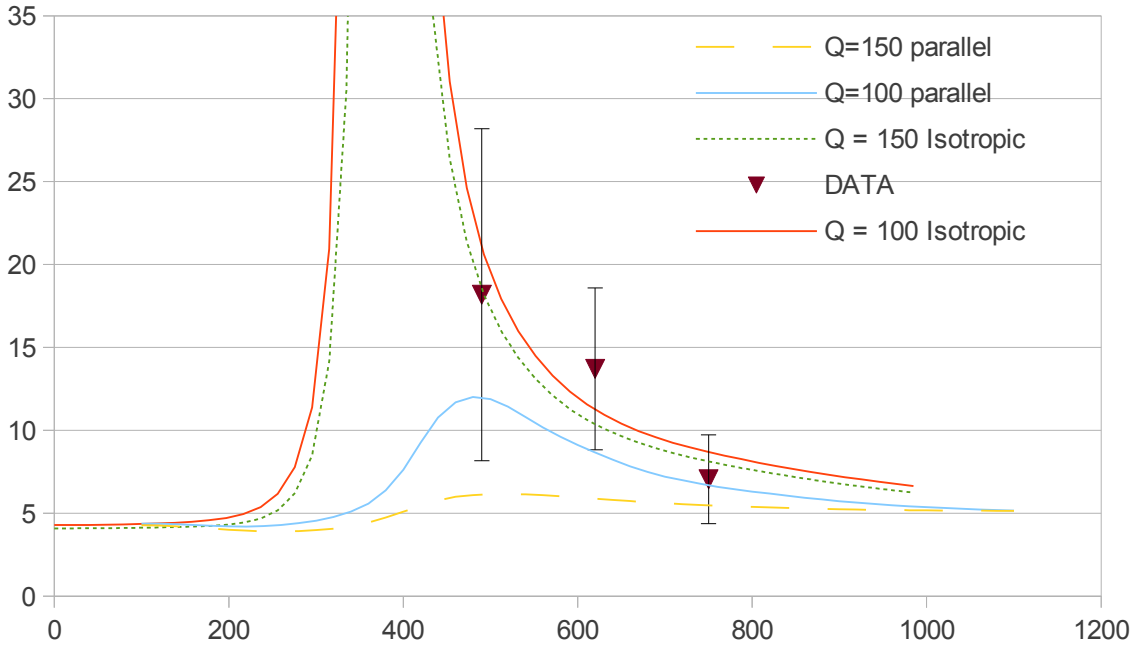

Fig 5: Comparison between the parallel and isotropic cases with our data.