Double to triple ratio.

During our last meeting we presented a decrease in the (e,e'pn)/(e,e'p) triple to double ratio, see fig 1:

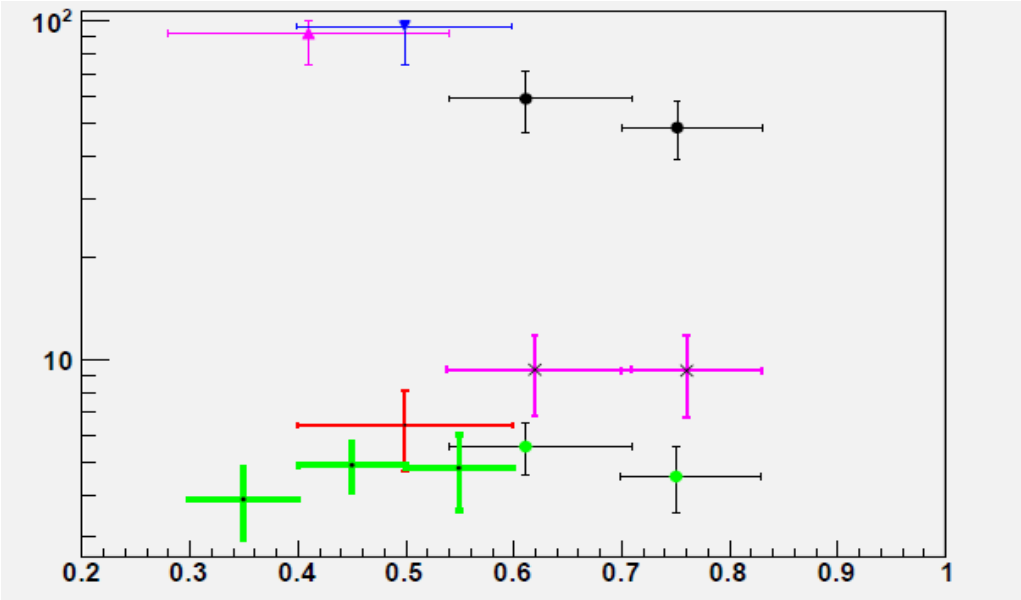

fig 1: Ratio vs Pmiss [GeV]. We see clear reduction of (e,e'pn)/(e,e'p), black points

The observed reduction ratio is from almost 100% to about 50%.
There are three possible effects that can explain this decrease.

The first one was raised by Doug during the last meeting. The decrease of the ratio is due to the increase of the denominator, number of (e,e'p) cause by delta contamination. These events do not have recoil partner.
The second option is that we have more contribution of more than 2N correlation. In this case we miss neutrons (protons) because of the limited HAND (BigBite) acceptance.
The third explanation to this effect can be due to increase of (e,e'p) events coming from FSI due to rescattering. The original nucleon had small momentum and no recoil partner.

In this report I will address only to the first point and I will show why, in our opinion, this effect is not responsible for the decrease of (e,e'pn)/(e,e'p) ratio.

The result in fig 1 was derived by using cuts on $x_B>1.05$ and $\omega<0.95$. These two cuts were used to remove the Delta.
In this report we use the cut that Peter used in his analysis i.e. two dimensional cut on ω and y-scaling. This change doesn't affect the results much.
The cut was placed based on visual examination of the data. We also perform a sensitivity check of this cut.
In fig 2,3 and 4 we present the ω vs y-scaling for 3 kinematic regions.

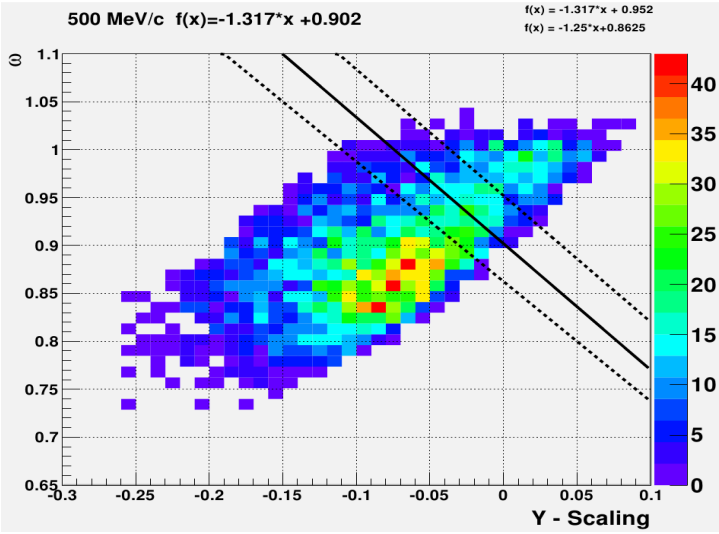

Fig 2: 500 MeV/c settings .

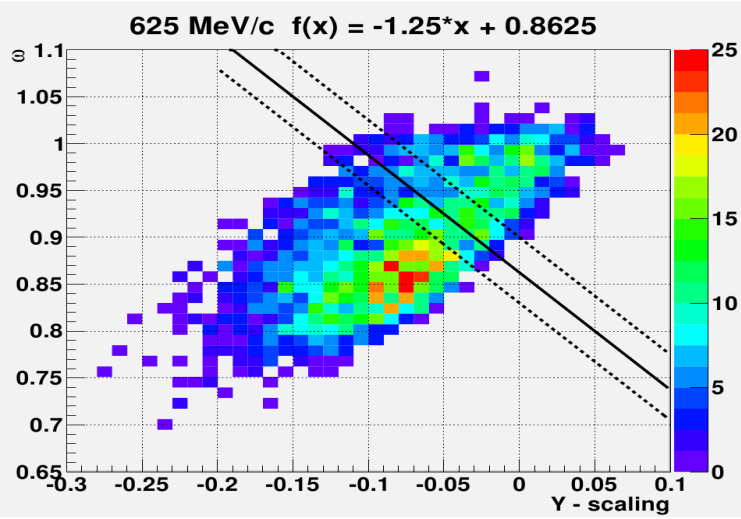

Fig 3: 625 MeV/c

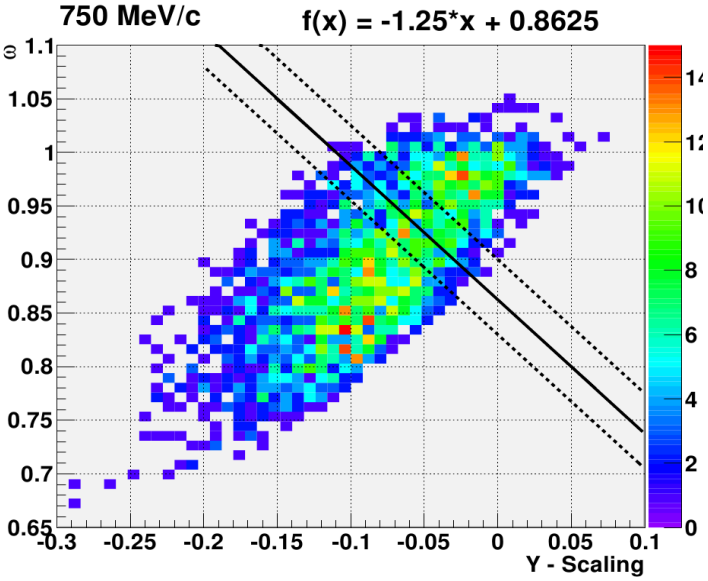

Fig 4: 750 MeV/c

The 3 lines, in Figs 2 – 4 represent different cuts that we applied to the data.
Based on these cuts the (e,e'pn)/(e,e'p) ratio was estimated. In Fig 5 we show the (e,e'pn)/(e,e'p) ratio for the 3 possible cuts for (e,e'p) identification:

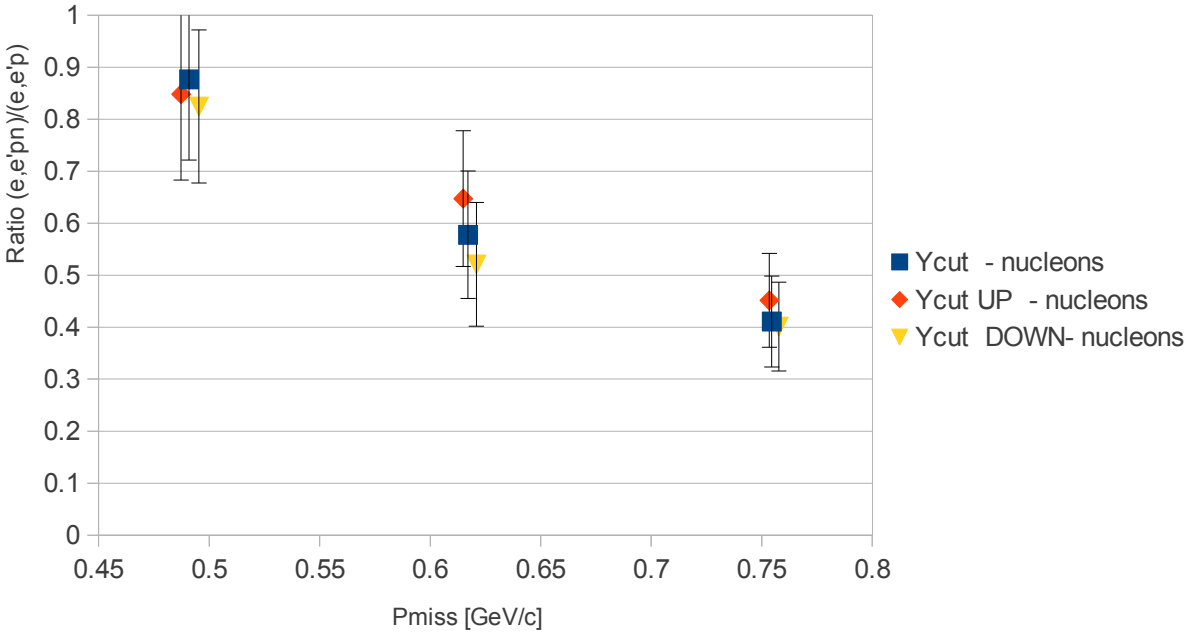

Fig 5: (e,e'pn)/(e,e'p) ratio for different cuts on ω - y-scaling plane.

For each cut I performed a simulation to find the correction factor. All simulation were performed with Pcm = 100 MeV/c. In fig 6, the correction factor is presented.

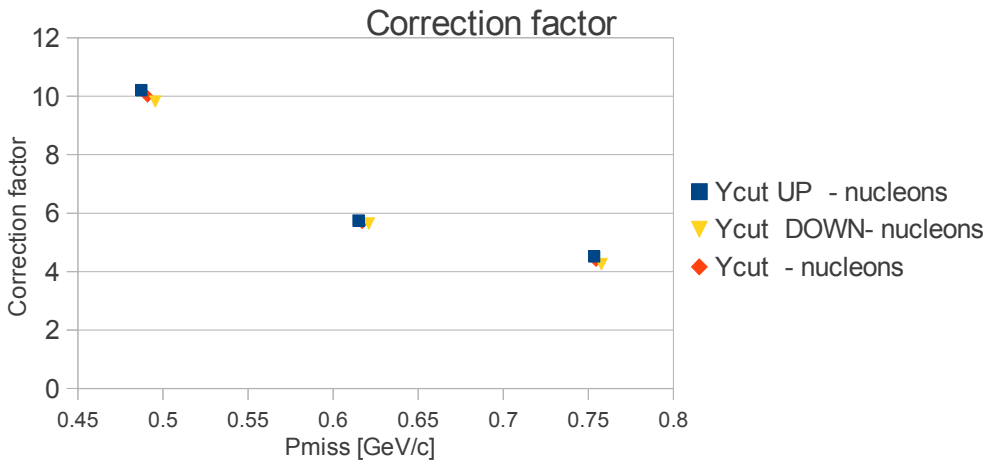

Fig 6: Correction factor.

Conclusion: there is no strong sensitivity of the (e,e'pn)/(e,e'p) ratio to the QE at within reasonable range.

Next step was looking on the missing mass distribution for (e,e'p) reaction and how the two dimensional y-scaling cut affect it, fig 7,8 and 9.

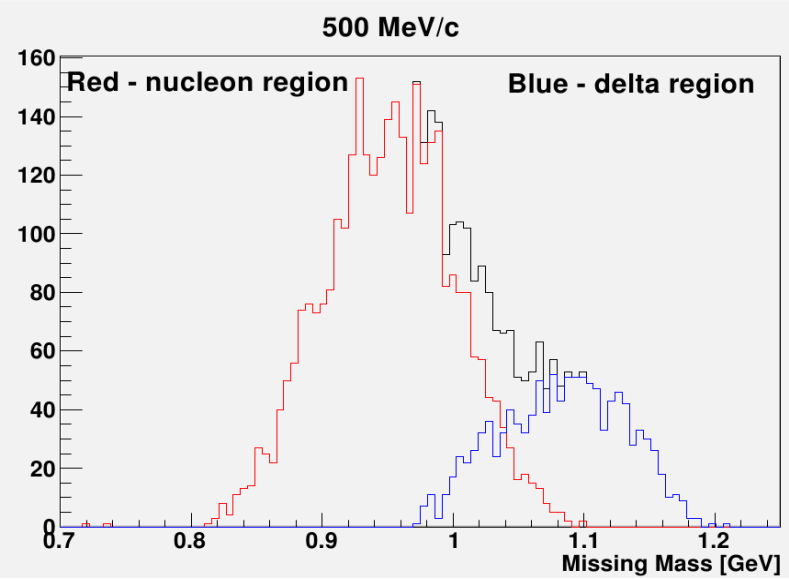

Fig 7: Missing mass distribution (e,e'p) for 500 MeV/c

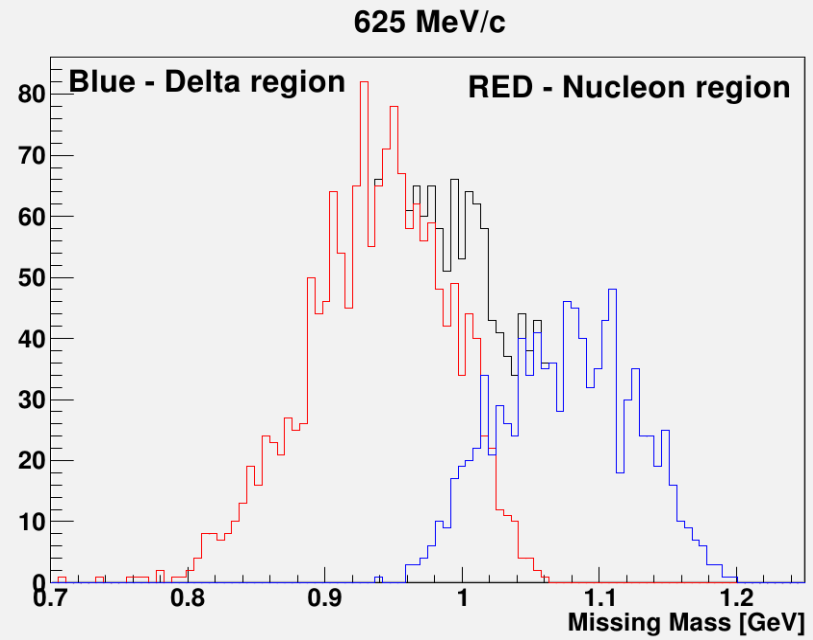

Fig 8: Missing mass distribution (e,e'p) for 625 MeV/c

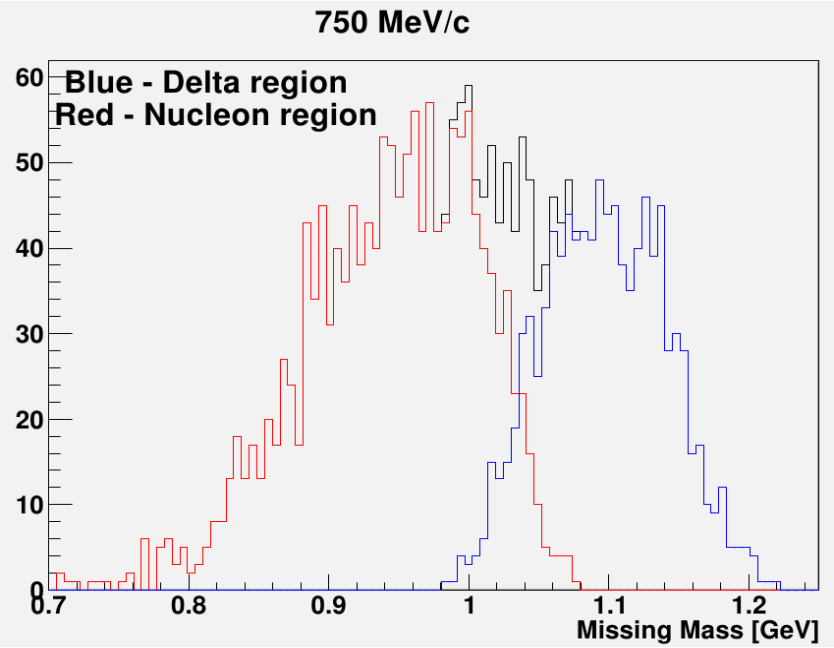

Fig 9: Missing mass distribution (e,e'p) for 750 MeV/c

Another sensitivity check was to apply a cut on the missing mass. We show results for the identified QE(e,e'p) events with missing mass<0.95 and missing mass>0.95.
The later is expected to have more Delta contamination:

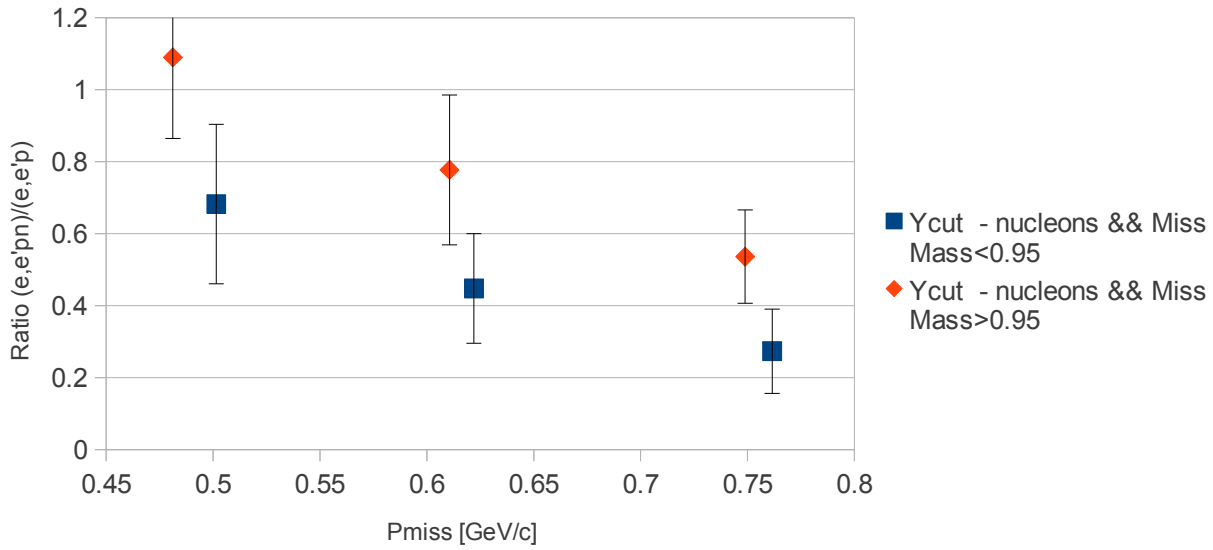

Fig 10: (e,e'pn)/(e,e'p) ratio

To summarize, we think that decrease in the triple to double ratio is not coming from the Delta contamination. It seems as if this contribution, do not change or maybe even increases the triple to double ratio instead to decreasing it.