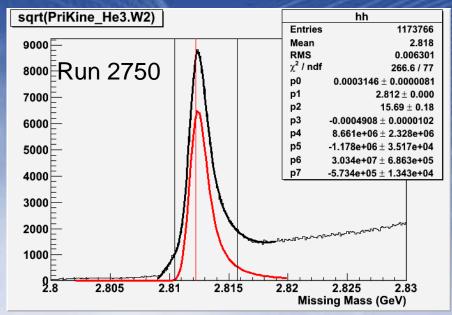
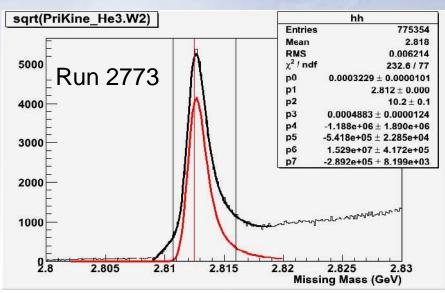
Slides on Oct11 weekly meeting for 1 pass elastic data analysis

Yi Zhang and Xin Qian

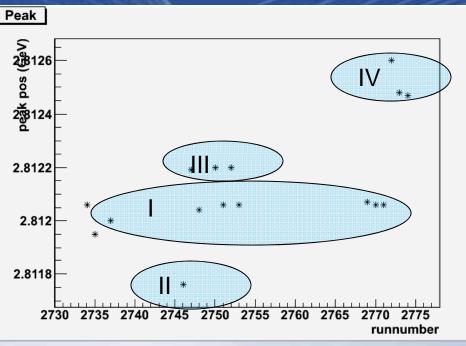
The fitting of elastic peak (Production Cell)





- The peak (red curve) is assumed to be a Landau function convolve with a Gaussian distribution
- There is a 2-order-polynomial universal background and another 2-order-polynomial background only after peak center.
- Motivation is to check the stability of the production cell yield, which require a good fitting to describe the shape to evaluate cuts.

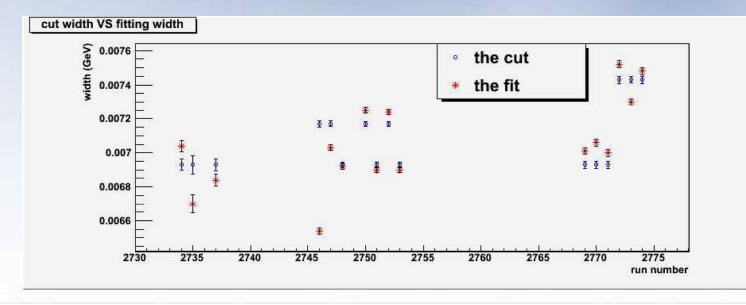
Stability check



Four different regions:

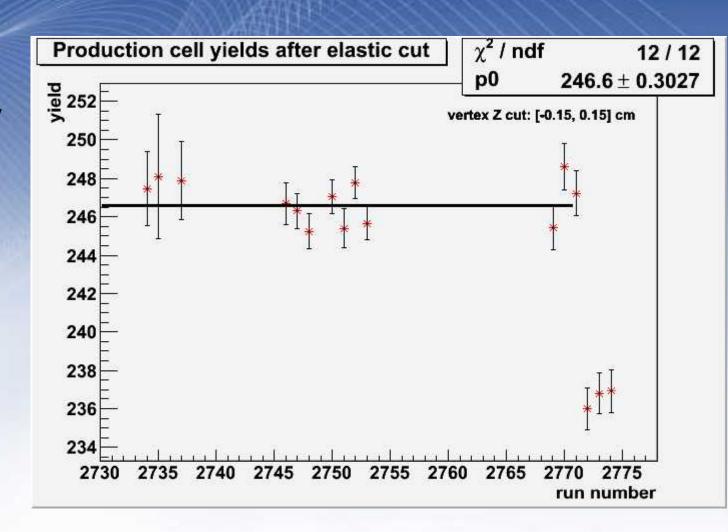
Within each region, use the average of the fitted width as the cut, except for the region II.

The used cuts are plotted in the plot below.



stability check of prod. cell yields

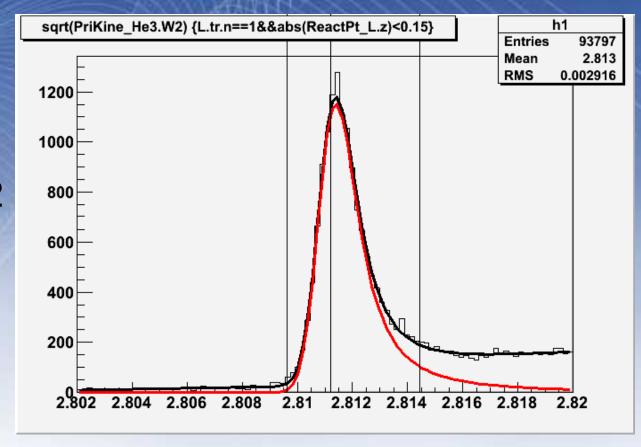
- Vertex z cut for every run is +-15cm
- Elastic peak in every run is fitted by a universal way.
- The last 3 runs are different on both yields and the peak (not sure why)
- The error bars are enlarged by 1.66 to ensure the chi^2/ndof = 1



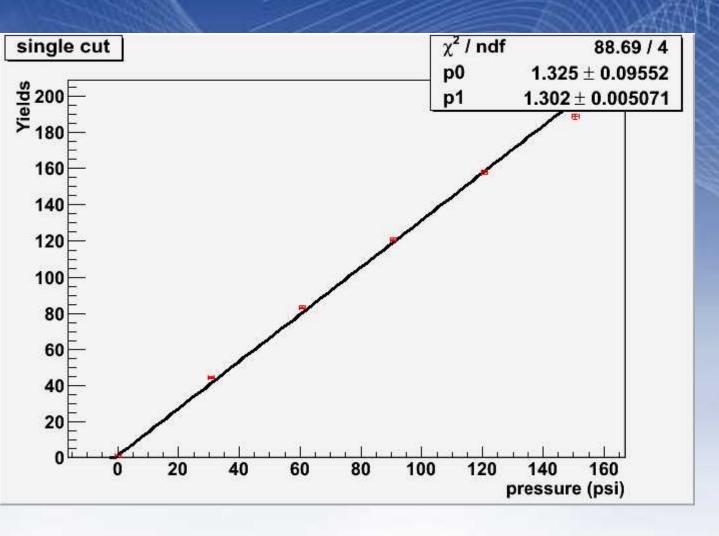
Stability check on Ref. He3 yield

The Ref. He3 data is much cleaner than the prod. cell case, due to the absence of the N2 gas in the cell.

 Only the run with highest pressure seems different from other runs.



Stability check on Ref. He3 yield



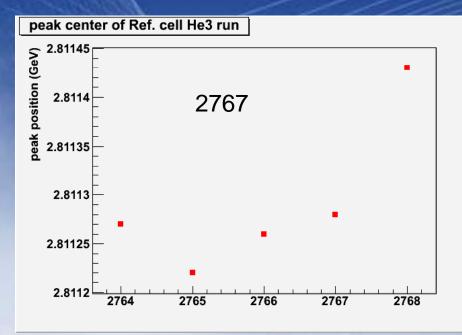
Highest Pressure curve: P = 150.7 psi

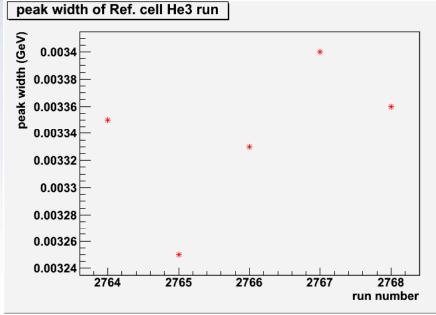
Y_exp = 197.5 Y_mea = 188.7

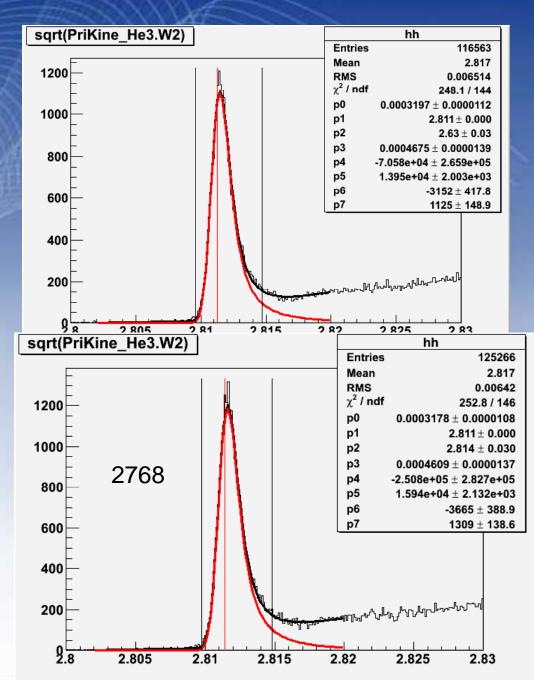
About 5 % discrepancies

he elastic cut (averaged one) sqrt(PriKine_He3.W2) in [2.80962, 2.81296]

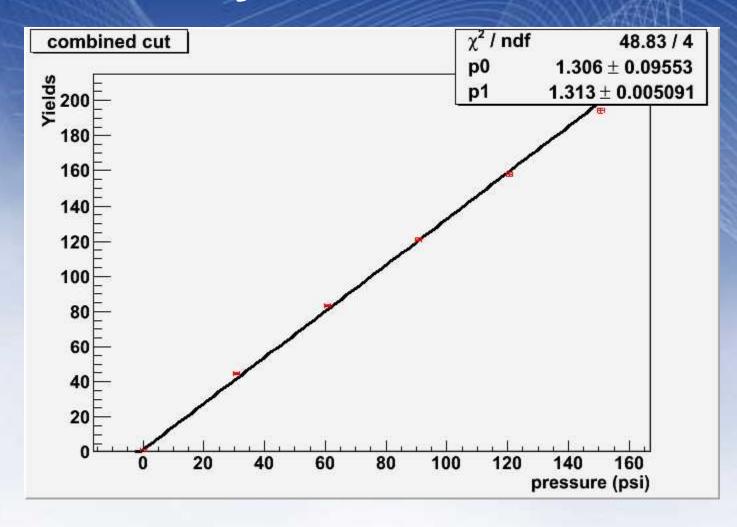
Fit Quality of Reference cell







Stability check on Ref. He3 yield

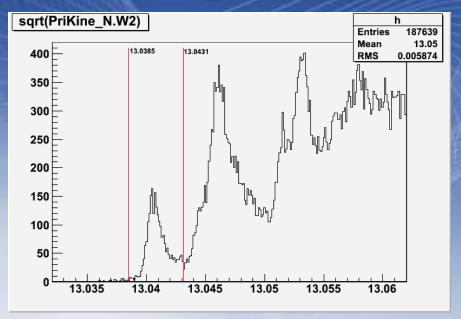


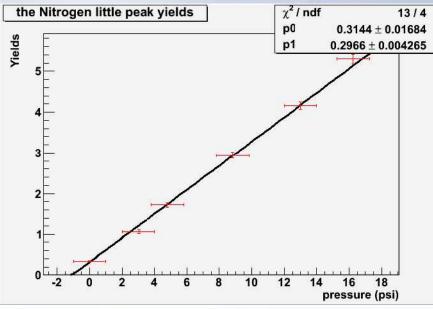
Y = 194.24

About 2.5 % discrepancies for the highest point

combined cut (universal cut plus highest one special)

Elastic peak of Ref. Nitrogen run

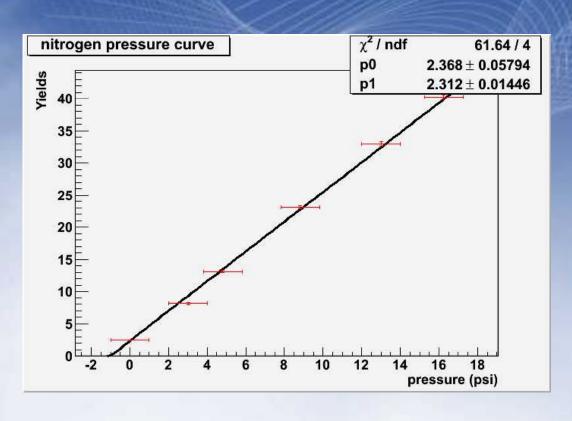




- It seems I cut on the first excitation state of the Nitrogen before
- From now on I choose the Nitrogen elastic cut as

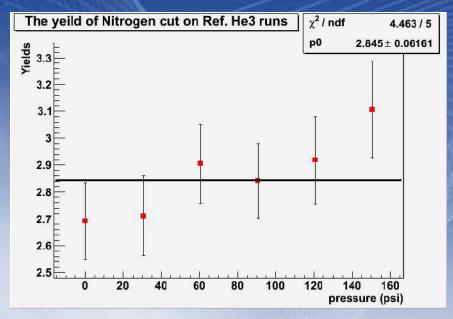
sqrt(PriKine_N.W2)<13.05&&sqrt(PriKine_N.W2)>13.0385)

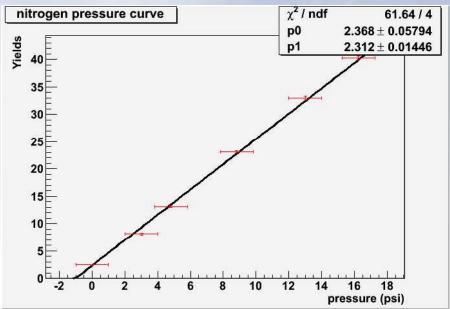
Elastic peak of Ref. Nitrogen run



 It is the new Nitrogen pressure curve (2 peaks included)

Contamination





 For the case of N cut on Ref/ he3 runs, no obvious leak is observed, but there is a trend going up.

Name	³ He (amg)	N_2 (amg)
		$0.11 \pm 5\%$ (relative)
Maureen		$0.106 \pm 5\%$ (relative)
Brady	$7.87 \pm 2\%$ (relative)	$0.11 \pm 5\%$ (relative)

- Take filling density: 1.62
 psi of N2 and 119 psi of
 3He. (possible of 0.2
 change in yield)
- Less than 5% bias due to the 3He contamination.

Contamination

- on Ref. N runs, the yields is over 50% of the yields of N cut itself (compare with last slide)
- 1.62 psi of N2 -> Y = 2.56
- 120 psi of 3He -> Y =
 157.6
- About 1.6%
 contamination of N2 in
 3He production cell.

