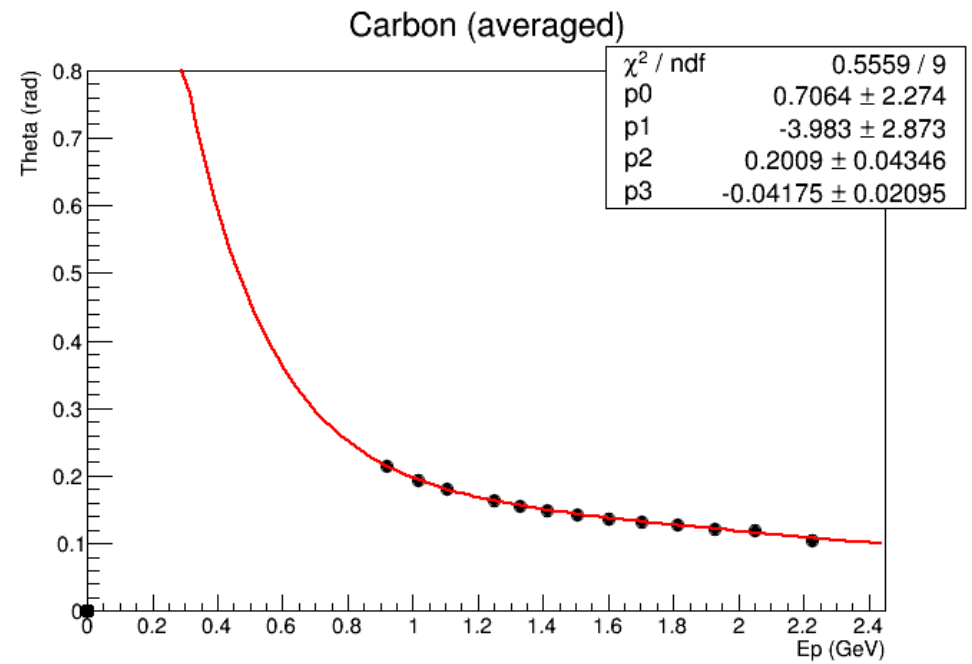
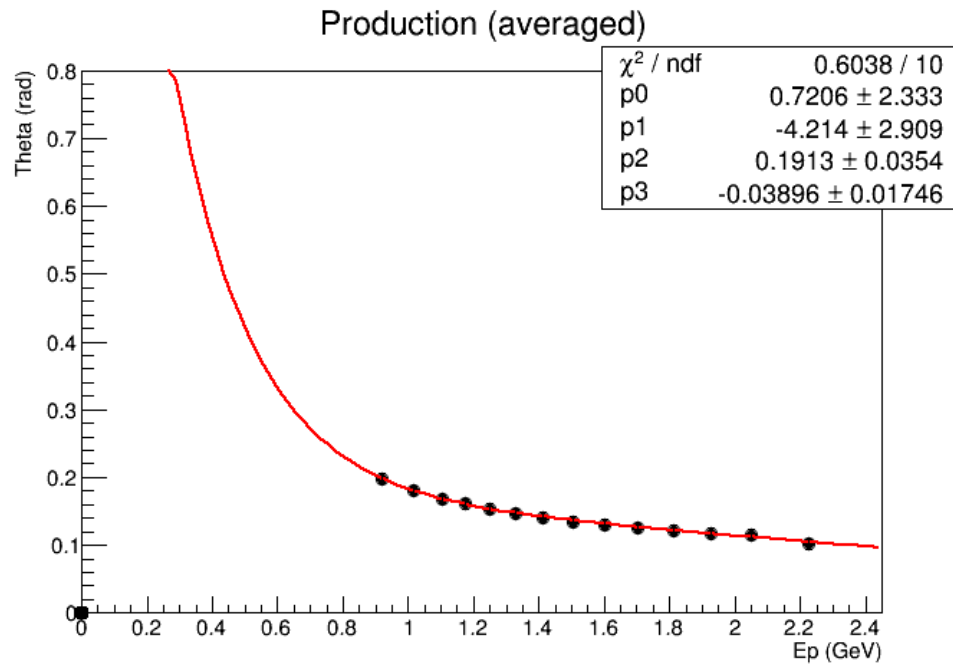


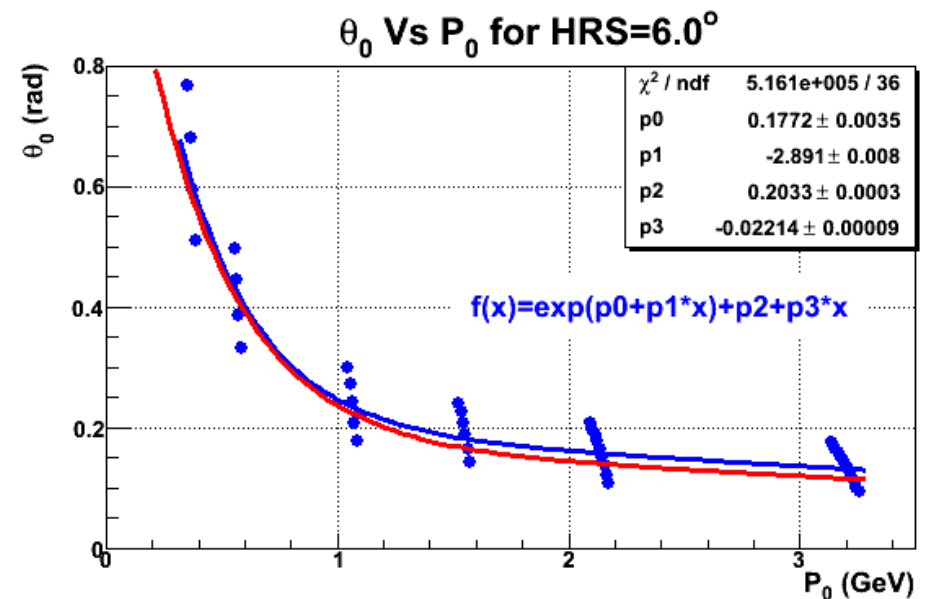
Dilution Update

4/15/2015

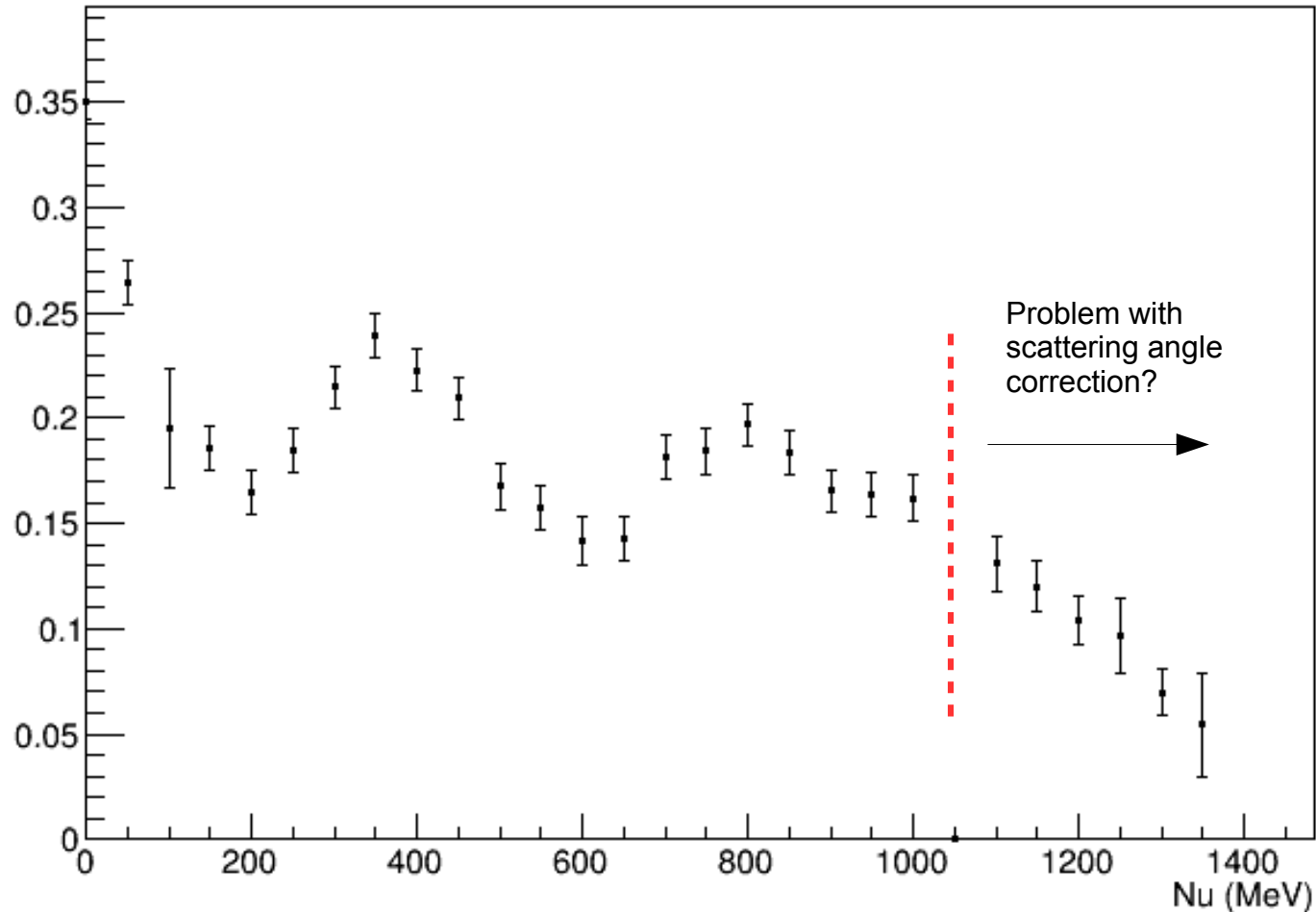
Fit to central scattering angle



- Comparison to model generated fit by Jixie (elog entry 47)
- Good agreement (considering data only extends down to 0.9GeV)
- For use in scaling scattering angle between run types (carbon dilution → nitrogen production)



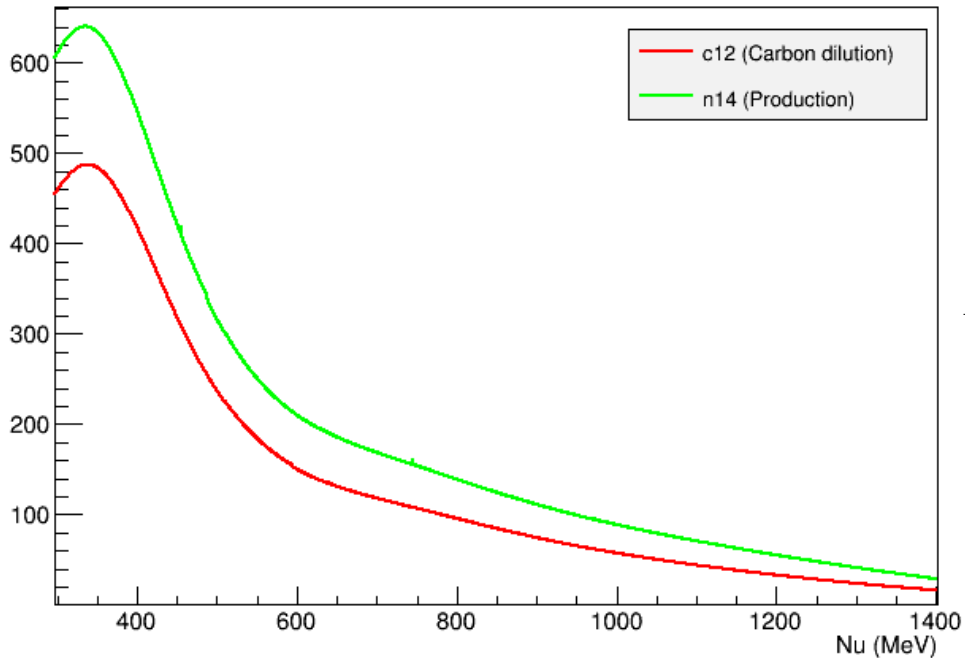
2.254GeV 5T Transverse Left Arm Dilution



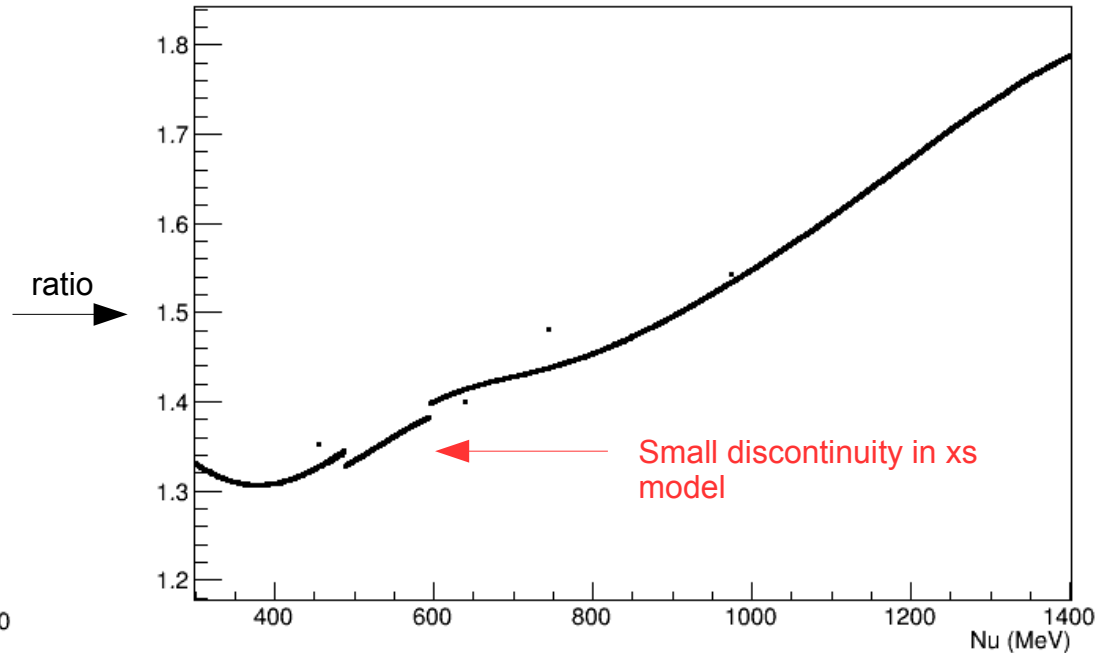
- Uses fully radiated XS model from P.Bosted to scale C12->N14
- Good agreement with model prediction at low nu.
- At high nu I run into a problem with scattering angle correction (next slide).

C12->N14 scaling factor

P.Bosted radiated XS model



XS ratio for 2.254GeV 5T Transverse Left Arm



Two XS models:

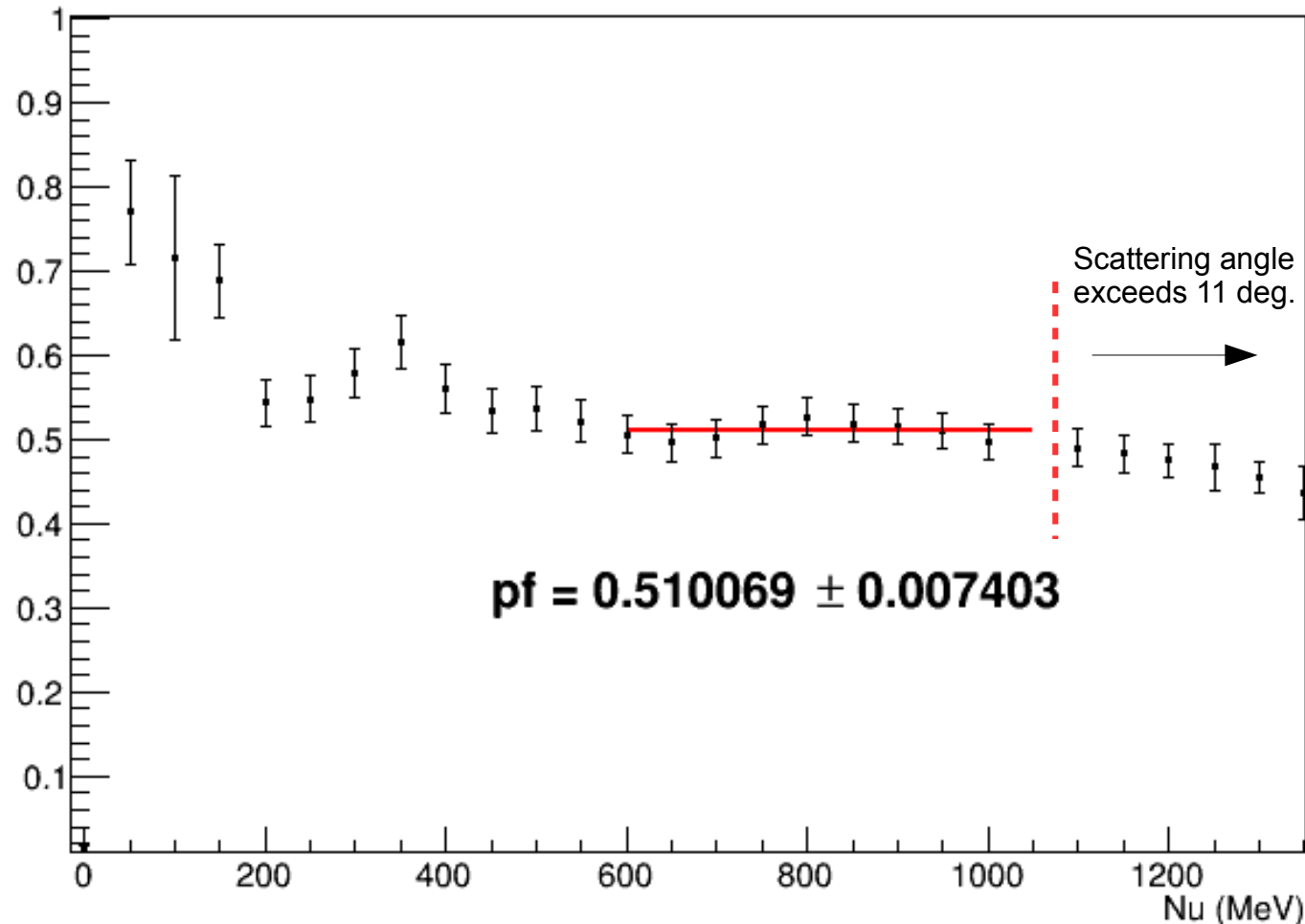
1. C12 model radiated using a radiation length of 0.00539 (0.1016cm carbon disk), and scattering angle from Carbon dilution fit (plot 2 on slide 1).
2. N14 model radiated using radiation length of 0.03108 (nitrogen during production) and scattering angle from Production run fit (plot 1 on slide 1)

N14/C12 ratio

- To be applied to the Carbon dilution yield to simulate Nitrogen background.
- The scale factor becomes very large (~80% correction factor!!) at large nu because the XS model becomes very small.
- XS model becomes small because the scattering angle becomes large.
- Large scaling factor has adverse effect on PF and dilution.

Packing fraction using secondary method

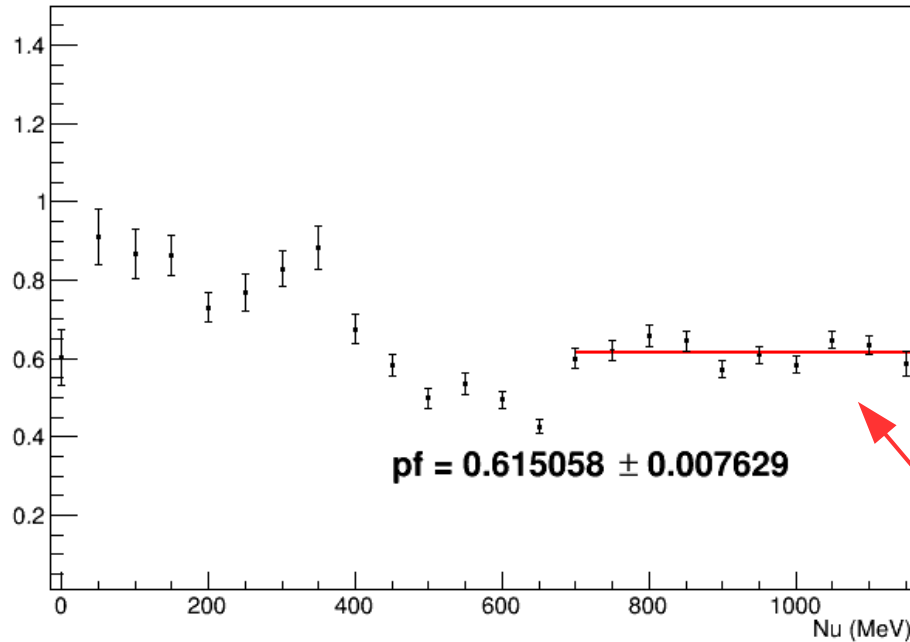
2.254GeV 5T Transverse material 19 Packing Fraction



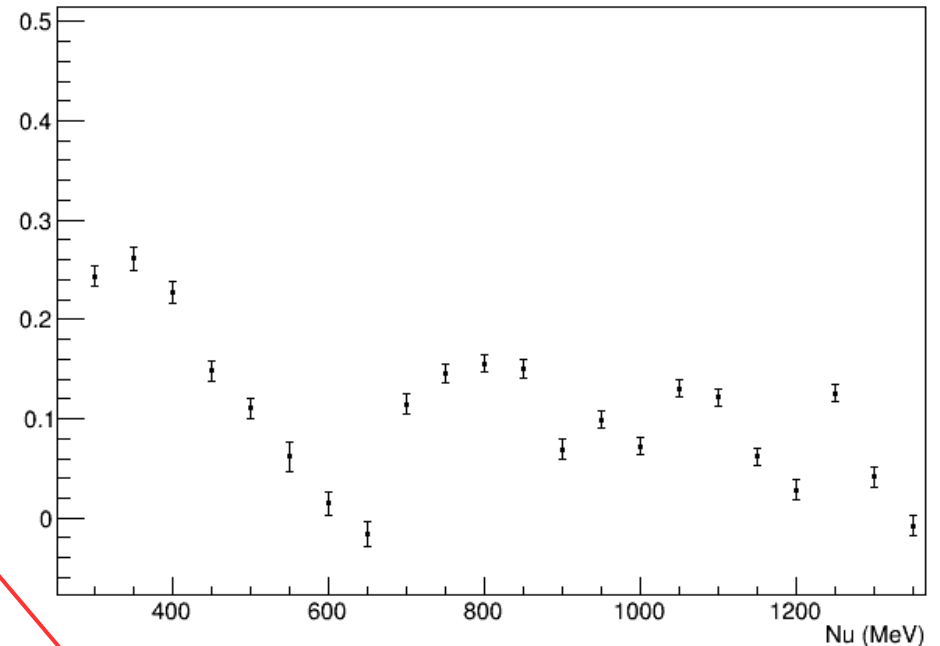
- Not really a valid reason to cut off fit at 1100MeV, but this method seems to break down (for calculating the pf and dilution) when the scattering angle becomes so large.
- Possibly due to extreme sensitivity to scattering angle.
- This is (temporarily) the packing fraction used to find the dilution for 2.254GeV 5T transverse.

2.254GeV 2.5T PF and dilution

2.254GeV 2.5T material 7 Packing Fraction



2.254GeV 2.5T Left Arm Dilution



Largest scattering angle at 2.2GeV 2.5T is 8 degrees

- Will recheck 2.2GeV 2.5T Transverse PF (different from Melissa's result). Beam position dependent yield problem may be affecting analysis here.
- Add statistical uncertainties.
- Finish other settings (1.1, 1.7GeV) and tech note!
- Suggestions from meeting.