pC A_N @ 250 GeV

pol. mtg. 26.05.11

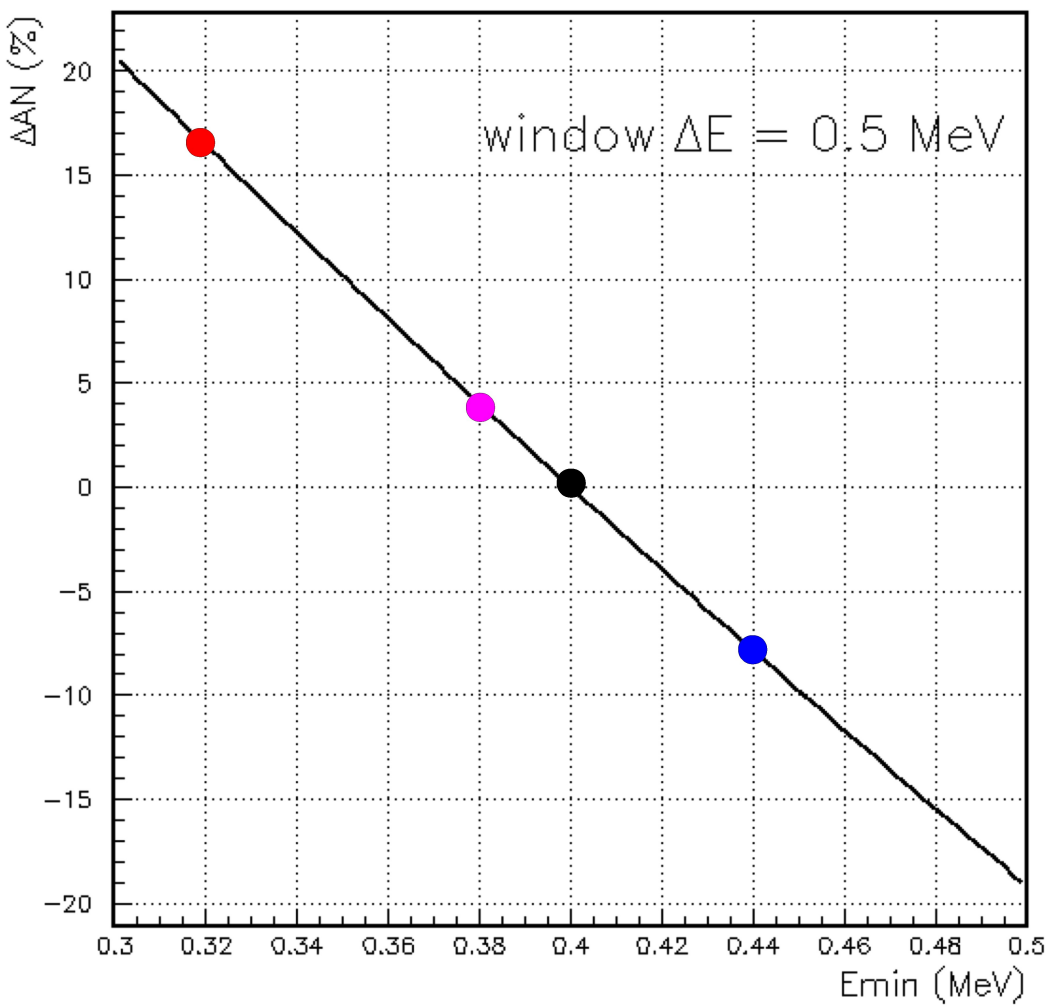
- Have measured pC A_N (normalized by H-jet):
  - Run 9 (averaged over polarims.?)
  - Run 11 B1U, Y2U, B2D, Y1D
- All claim to have C k.e. range T=0.4-0.9 MeV
- They differ; can't all be correct
- Suppose A_N OK, <u>k.e. range wrong</u>. How much?
- Suppose e.g. Run 11 B1U, Y2U 'correct', variations:

	A_N	ΔA_N
Run 11 B1U, Y2U:	0.0124	0
Run 11 B2D:	0.0114	-7.7%
Run 11 Y1D:	0.0128	+3.6%
Run 9 (avg.?):	0.0144	+16.6%

- Try fixed E-window width 0.5 MeV, adjust Emin
- exponential dN/dT, poly. $A_N(T)$ param. (shown last week)

ΔA_N vs. Emin

- ΔA_N(%) vs. Emin (E-window low edge)



- Put values of ΔA_N on curve, read off shifted values Emin:

	ΔEmin
B1U/Y2U	0
B2D	+40 keV
Y1D	-20 keV
Run9	-80 keV

- Can explain A_N discrepancies:
- Energy mismeasurement 20-40 keV ⇒ Run11 up/downstream
- " " ~80 keV ⇒ Run9/Run11

Dead layer E correction

Run 9:

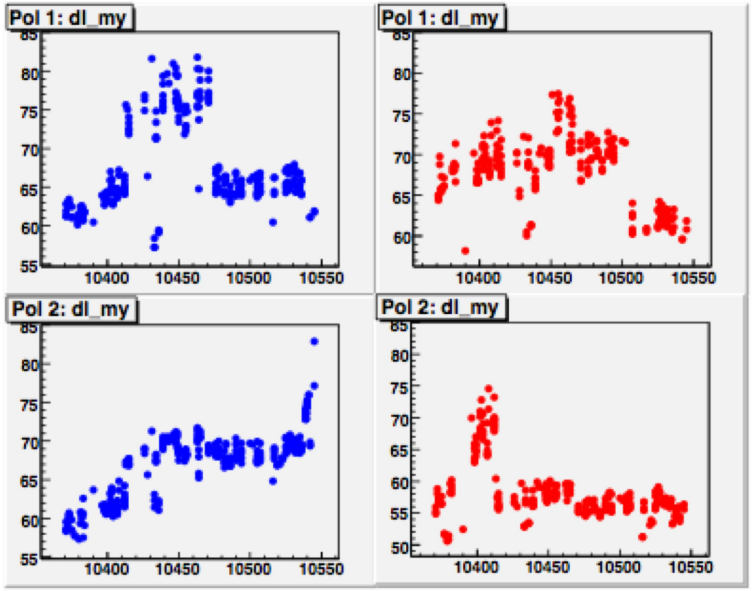
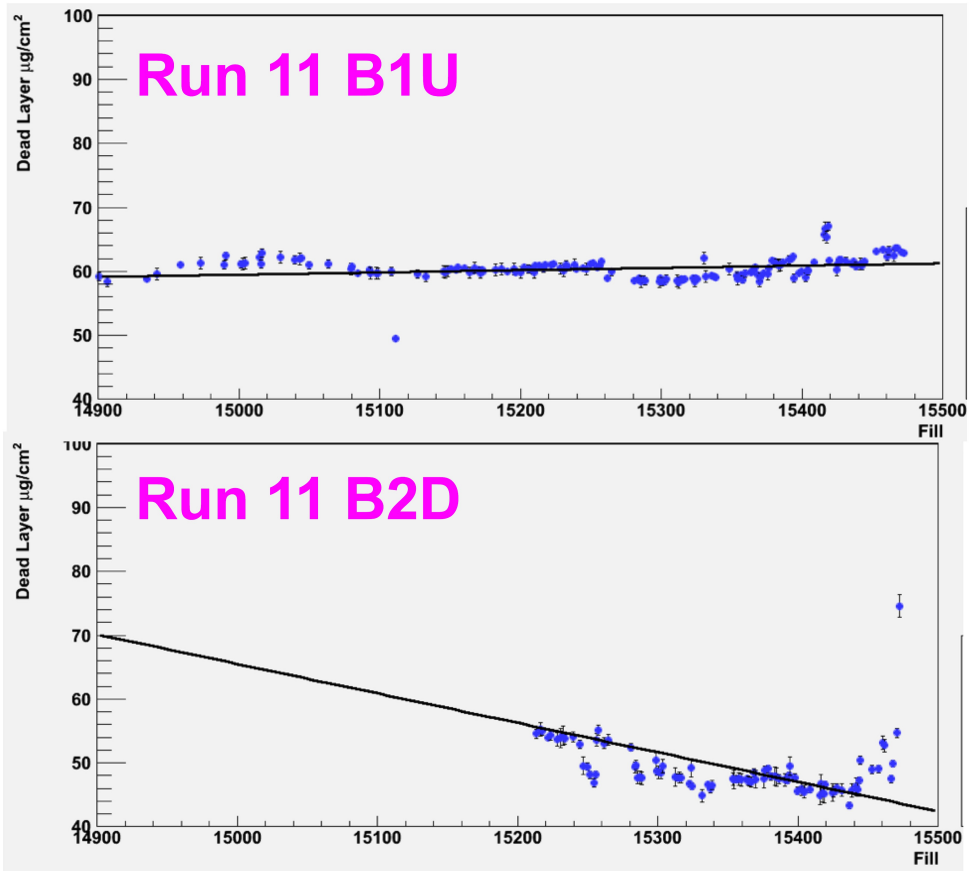


Figure 19. x_{DL} (μg/cm^2), averaged over the polarimeter strips in $\sqrt{s}$=500 GeV measurements vs fill number (each fill usually had several measurements, all of them are shown here); top left - Blue1, bottom left - Blue2, top right - Yellow1 and bottom right - Yellow2.



Rough estimates by eye:

- B1U/Y2U – 60 μg/cm^2
- B2D – 46 μg/cm^2
- Y1D – 64 μg/cm^2
- Run9 – 60-80 μg/cm^2

Dead layer E correction

- Measured ^{12}C stopping power in Si:

- For E=400-900 keV
  $dE/dx \approx 3\ \mu g/cm^2$

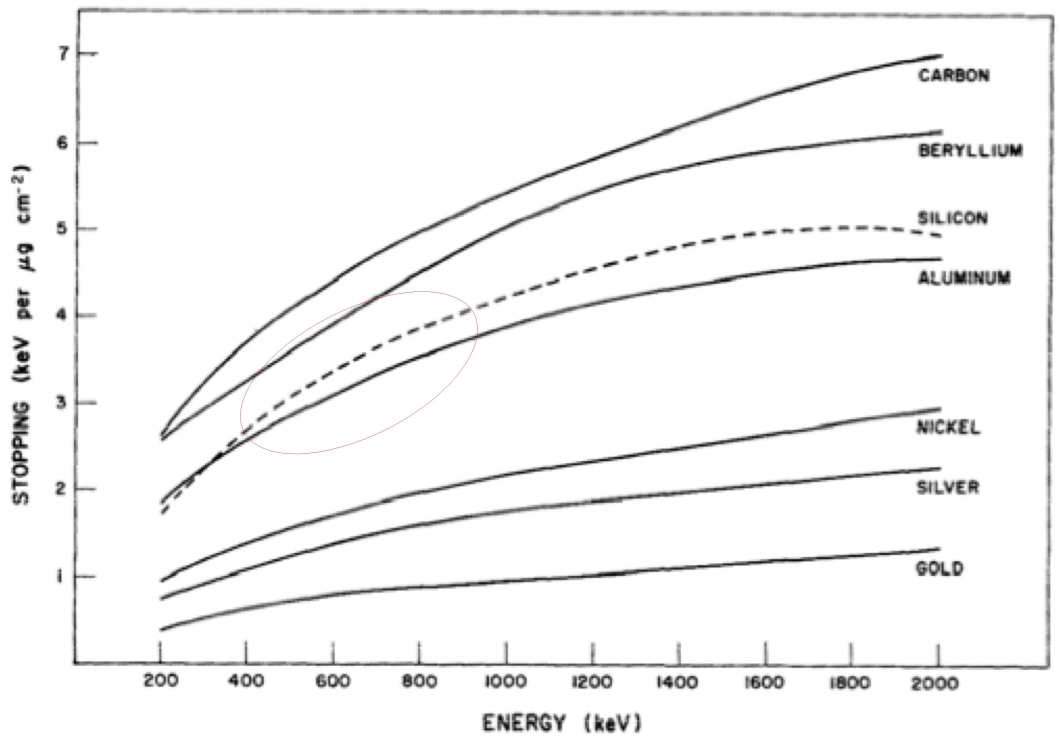


Fig. 3. Energy dependence of stopping values of some elemental films for ^{12}C ions. The lines represent polynomial least-squares fit to our measured data.

<u>Rough DL E corrections:</u>

- B1U/Y2U – 180 keV
- B2D – 138 keV
- Y1D – 192 keV
- Run9 – 180-240 keV

Dead layer E correction

- The corrected energy is: $E_{corr} = E_{meas} + E_{DL}$
- Suppose used wrong correction: $E'_{corr} = E_{meas} + E'_{DL}$
- Then the shift from wrongly corrected E to true E is:

$$E_{corr} - E'_{corr} = E_{DL} - E'_{DL}$$

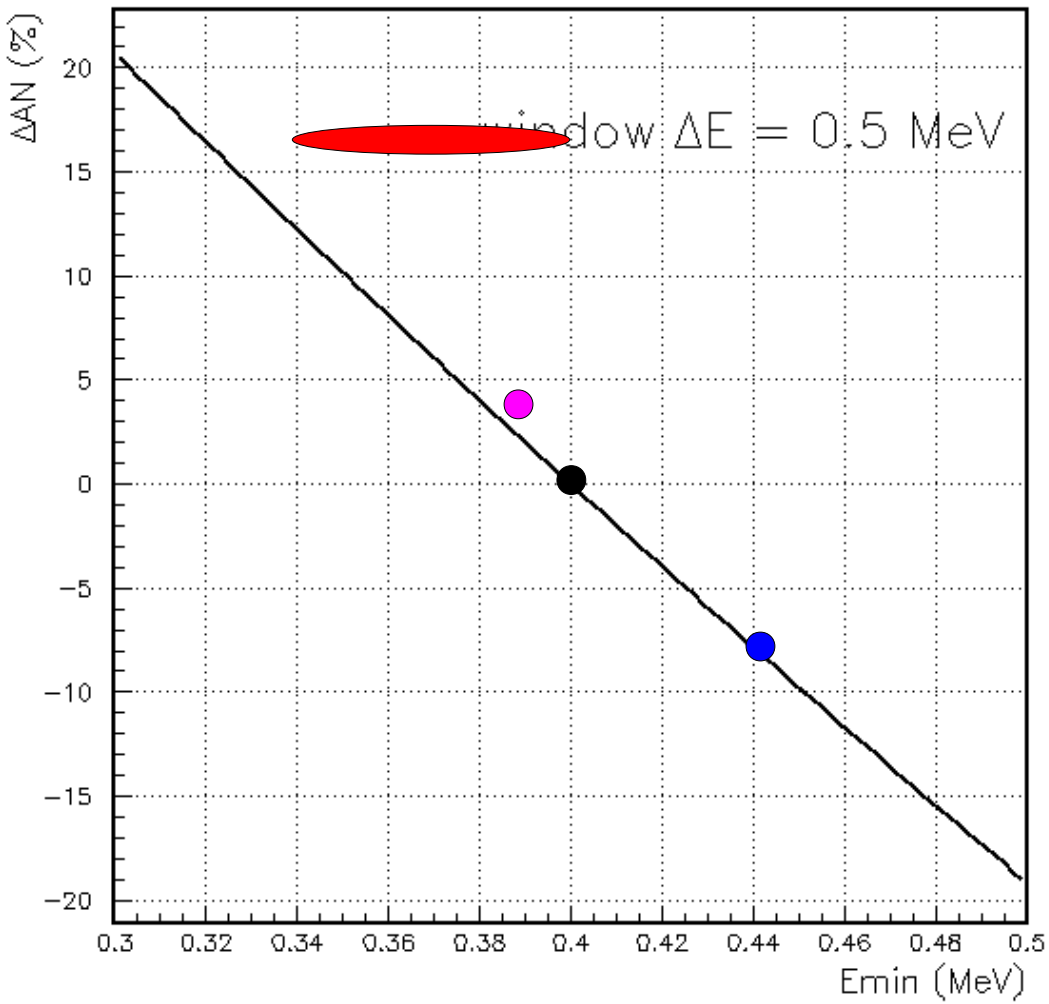
- Suppose in reality DL is always the same.
- Take, e.g. the Run 11 upstream DL correction; then shifts are:

	$E_{DL} - E'_{DL}$
B1U/Y2U	0
B2D	+42 keV
Y1D	-12 keV
Run9	0 → -60 keV

- e.g. for B2D thought Emin=0.4 Mev, really Emin=0.442 MeV

A_N vs. Emin

- Plot measured A_N vs. these shifted Emin:



	ΔEmin=Emin-0.4
B1U/Y2U	0
B2D	+42 keV
Y1D	-12 keV
Run9	0 → -60 keV

- The measured A_N and shifted Emin ~on same curve, consistent

- Explains well the Run 11 up/downstream discrepancies
- Could cover a lot of Run9/Run11 discrepancy
- Magnitude, ordering of these shifts highly suggestive

Summary

- A fixed Dead Layer energy correction,

  same for all detectors, running periods,

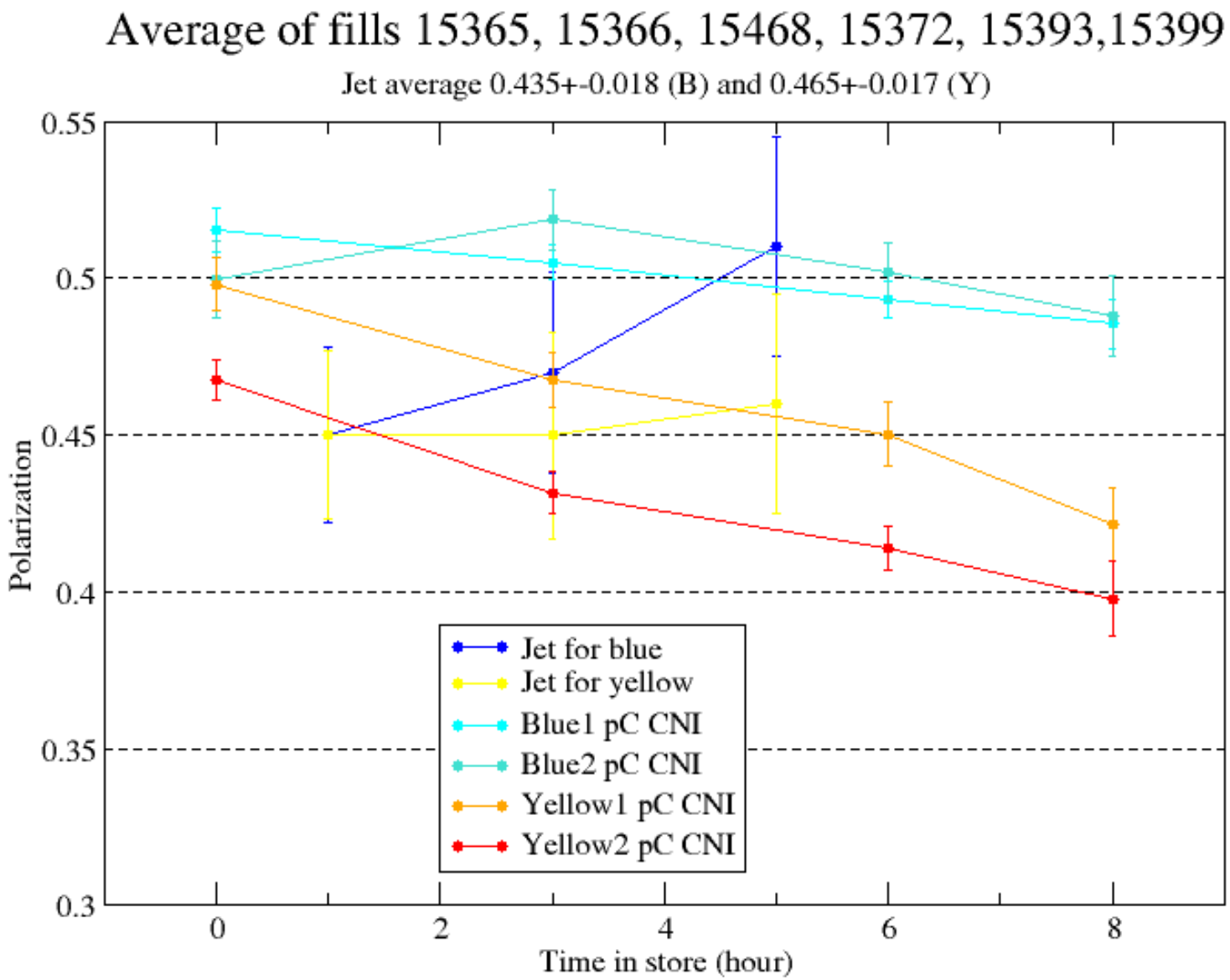
  can largely explain the different A_N measured @ 250 GeV
- A more precise handling of DL correction as implemented,

  dEdx, etc. may account for all discrepancies

- <u>Final note:</u> overall scale of A_N, E may be shifted;

  discussion here was adjusted to Run 11 upstream values

EXTRAS

Polarization decay

- Haixin's analysis; pC/H-jet ratio applied twice?