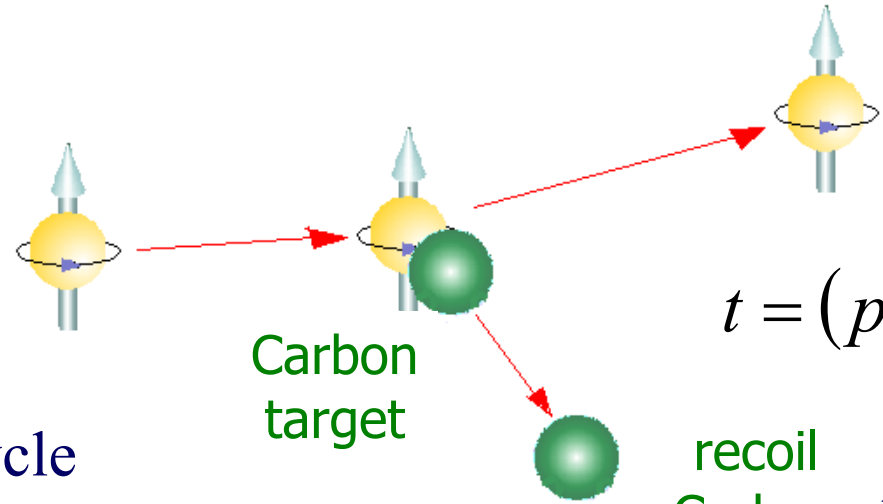
STATUS of AGS CNI POLARIMETER

Dima, Gerry, Haixin, Igor, Jeff, Osamu, Sandro
et al.

UP & RUNNING !

P_{BEAM} > 40% and rising

Principle



flip spin
each AGS cycle

$$t = (p_{out} - p_{in})^2 < 0$$

measured with
Si detectors
left – right of the beam
and WFD
time – energy info

$$P_{beam} = -\frac{1}{A_N} \cdot \frac{N_{left} - N_{right}}{N_{left} + N_{right}}$$

we are detecting
the recoil

$A_N \sim 1\%$ … small
requires large
statistics $> 10^7$

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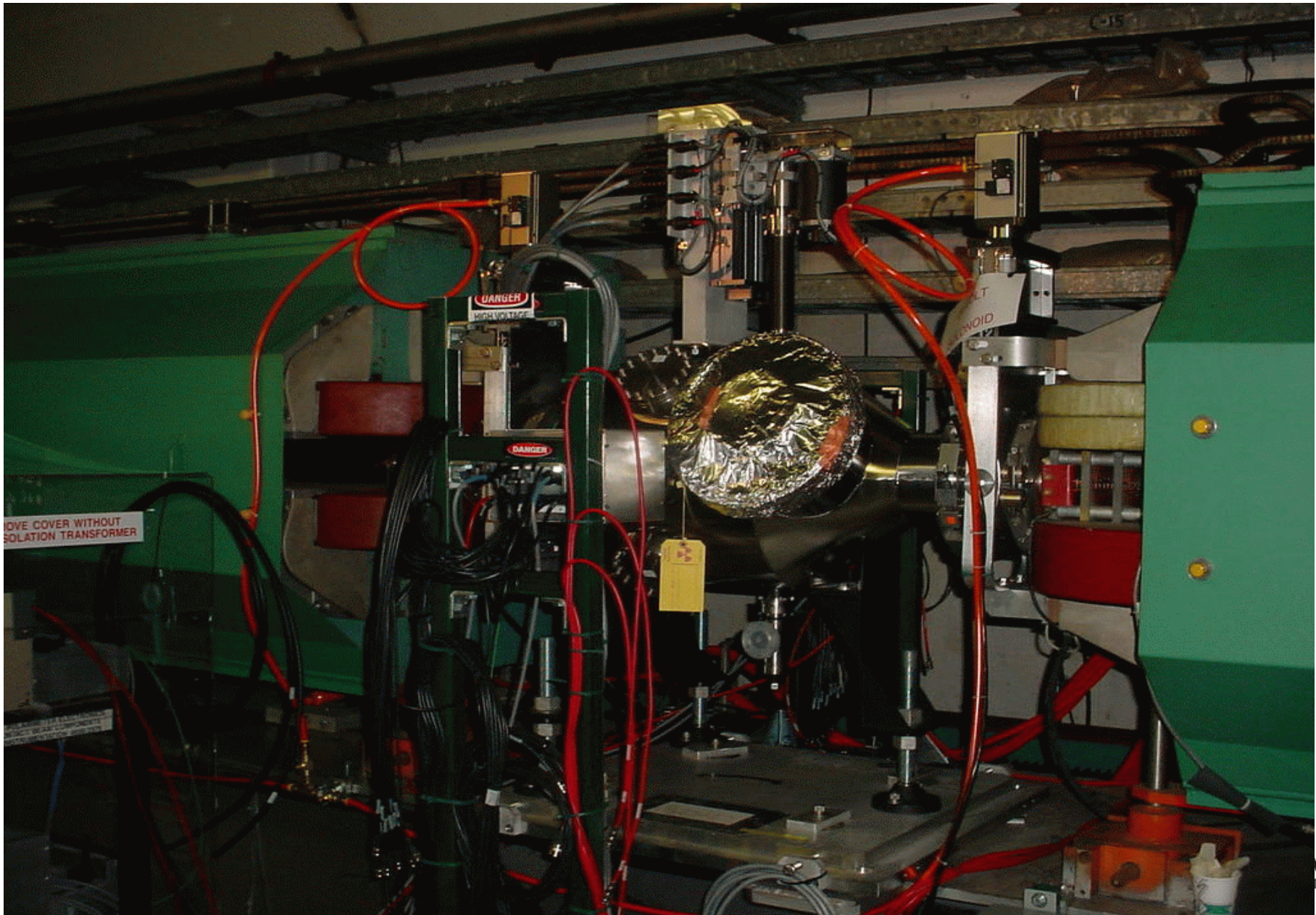
A Picture of the Setup



Hall of Fame ’03: 40 % and rising

Haixin

> 50 % ?

40 % and more

03/17

39 %

Leif
03/15

Waldo
03/14

38 %

32 %

Waldo
03/14

30 %

Mei
03/11

17 %

Mei
02/28

while Osamu
was sleeping …

RHIC Experimenter Status
BRAHMS (ZDC): 0.00
STAR (ZDC): 0.00

Monday, March 17, 2003

23:30 Problems with beam loss on the ramp. Still investigating.
Above 40% polarization was measured at AGS extraction porch

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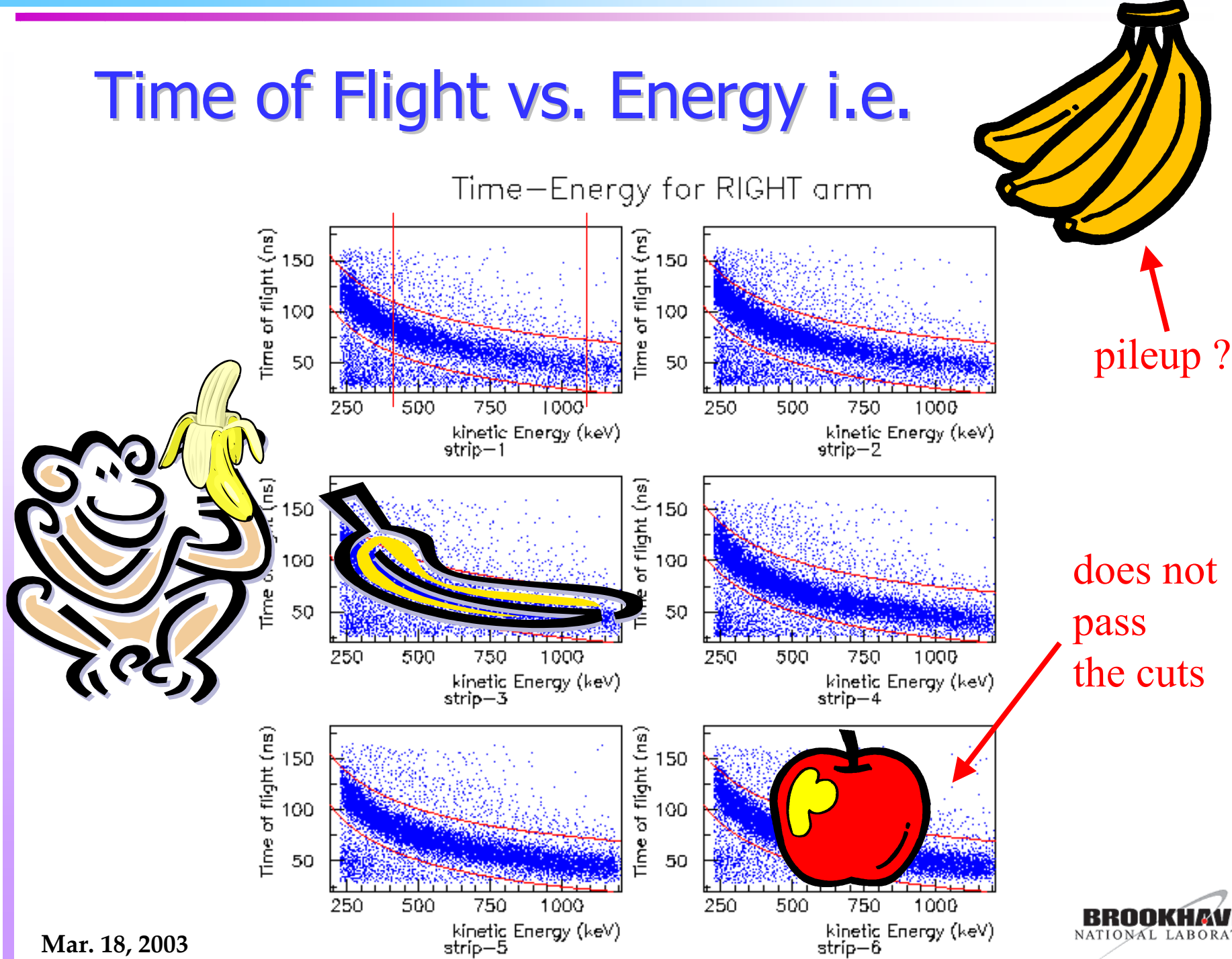
Time of Flight vs. Energy i.e.



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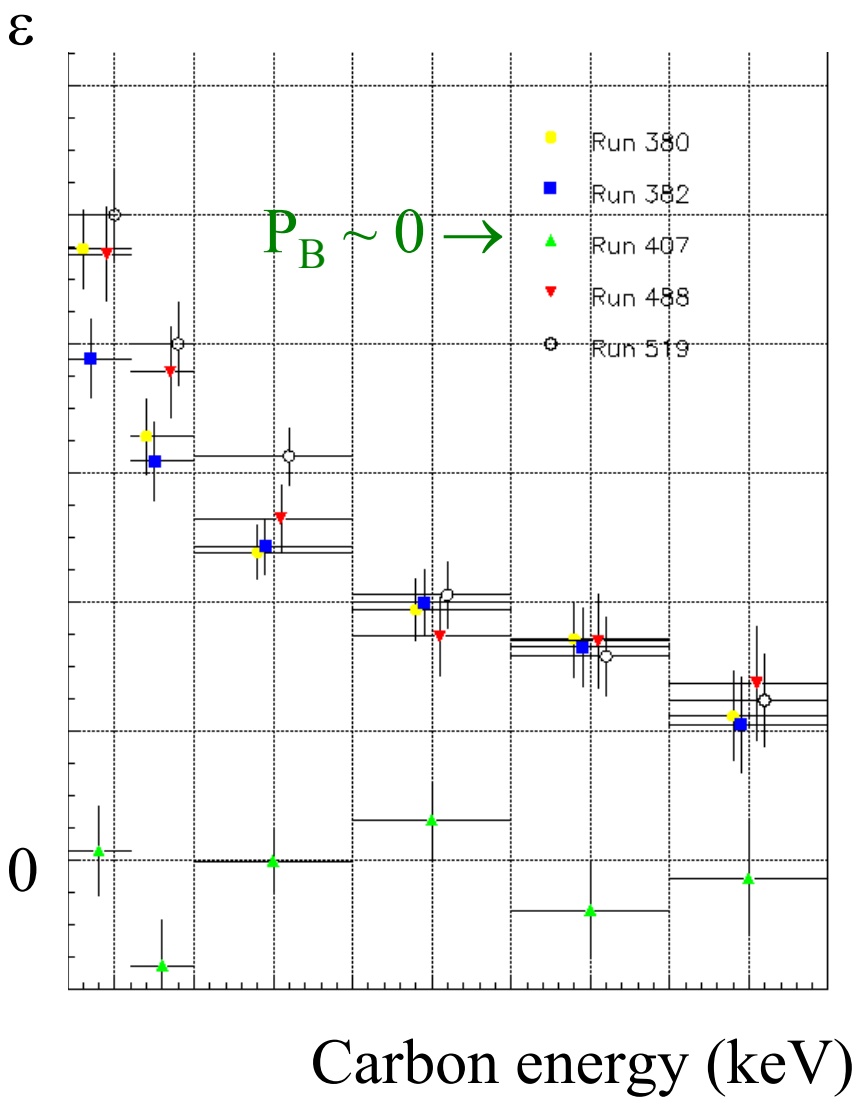
Raw Asymmetry



$$P_{beam} = \frac{1}{\langle A_N \rangle} \cdot \varepsilon_N$$

$$\langle A_N \rangle = \frac{\sum N(t_i) A_N^{th}(t_i)}{\sum N(t_i)}$$

calculated over several t bins

A_N^{th} from Larry's fit to E950 data

$$< A_N > = 1.08$$
$$0.009 < |t| < 0.025$$

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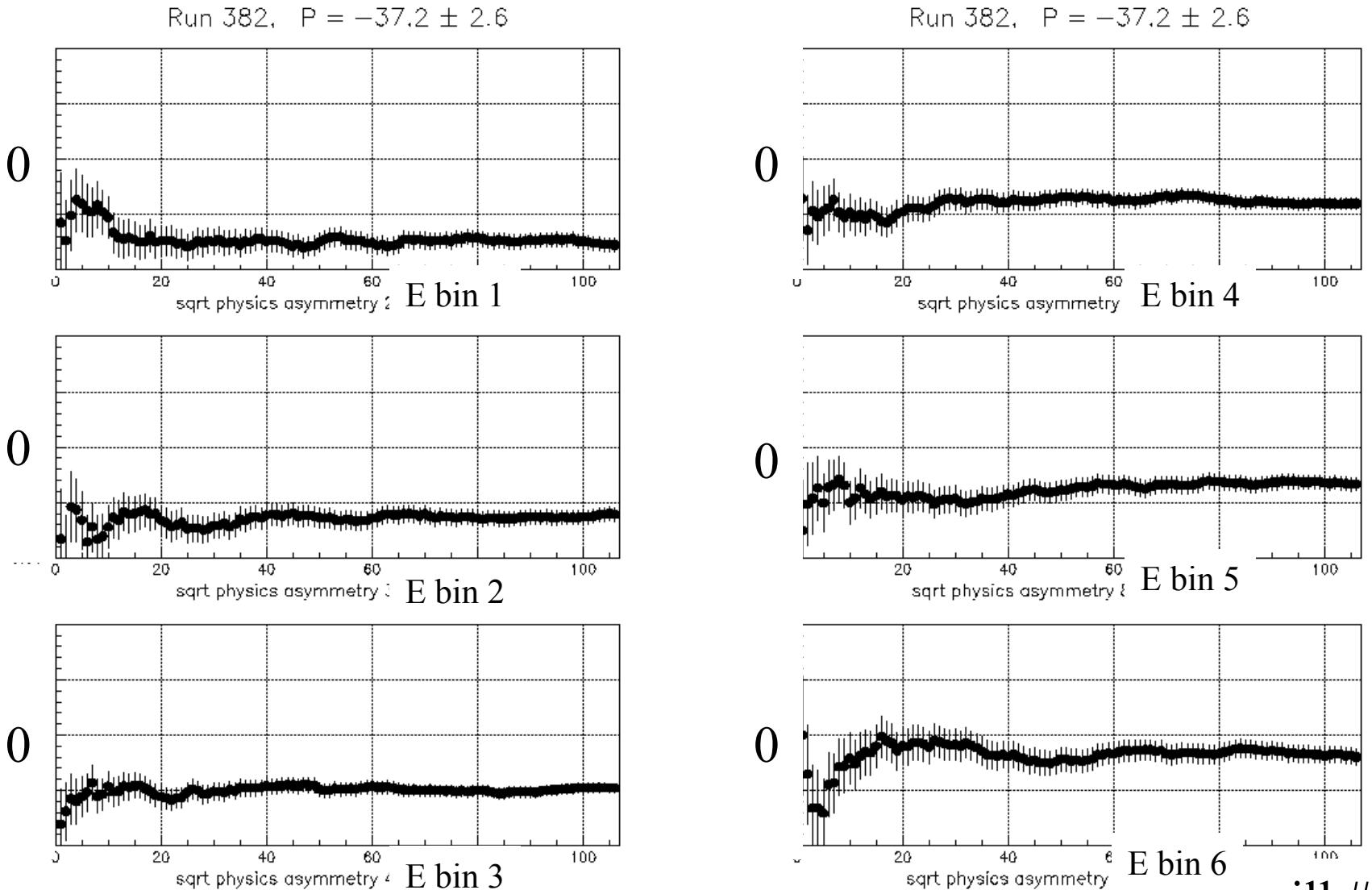
Raw Asymmetry Spill by Spill (Integral)



for different Carbon energy bins

Comparison with E880 Polarimeter

polarization measurements

AGS - CNI	E880
–0.365 ± 0.030	
–0.359 ± 0.029	
–0.349 ± 0.030	–0.370 ± 0.045
–0.349 ± 0.030	

E880 proven to be correct (just kidding …)

AGS-CNI works! YES !!!

Larry's fit is GREAT

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Looking Forward

- polarimetry
  - decrease measurement time, below 5 min.
  - 6 bunch mode
  - measure beam polarization on the ramp
  - run at higher intensities
  - transfer polarimeter to *operators*
- physics
  - different energies between 4 to 24 GeV
  - broader t range, $0.004 < |t| < 0.2$ GeV^2

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