- **Feedback from the CPP/NPP ERR**

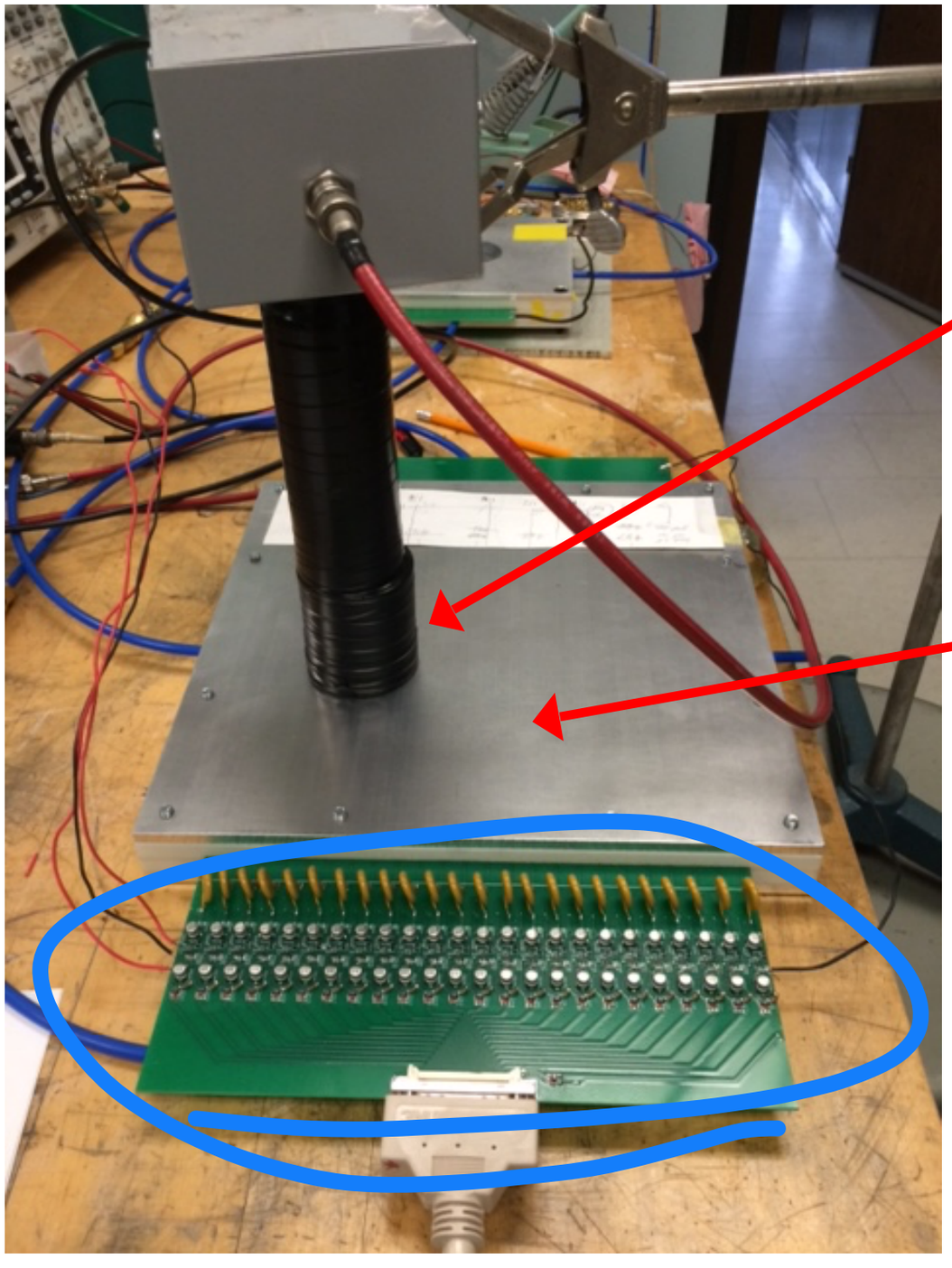
MWPCs: provide (i) detailed status of detectors, (ii) HV plateau and TOF distributions, (iii) efficiency measurements, and (iv) expected rates per MWPC plane

Trigger: provide (i) expected rate increase by having the target 60 cm upstream of the nominal position, (ii) a plan for measuring trigger efficiency, and (iii) expected data rates

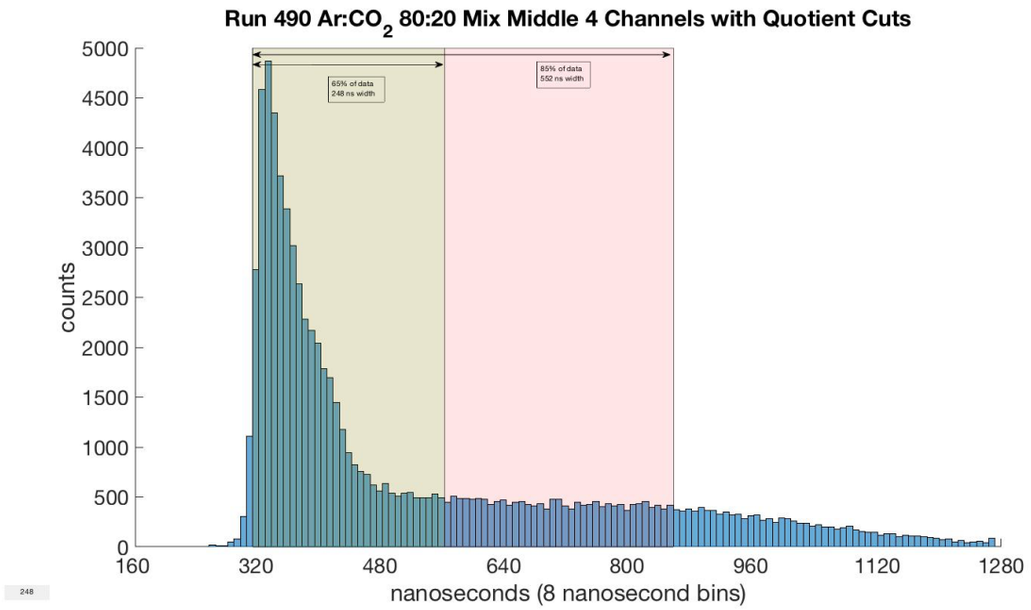
Reconstruction, simulation and data analysis software: (i) work started, but no completion dates given, (ii) must have names assigned, (iii) how MWPC and TOF trigger efficiencies affect results, and (iv) publication timeline not given

Cosmic-ray tests of a small MWPC using the fADC125

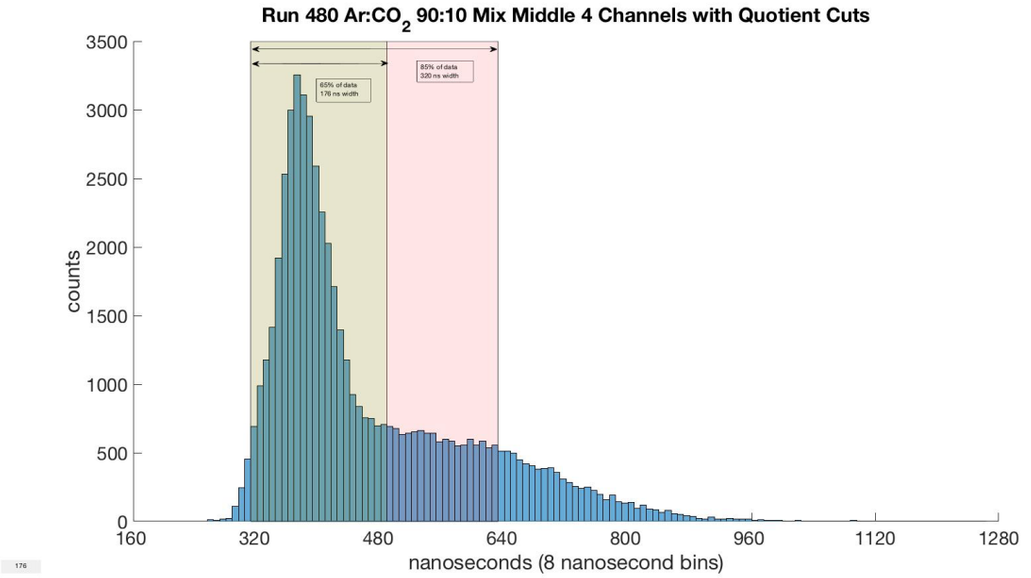
From Hall D
collaboration meeting
Oct. 2017



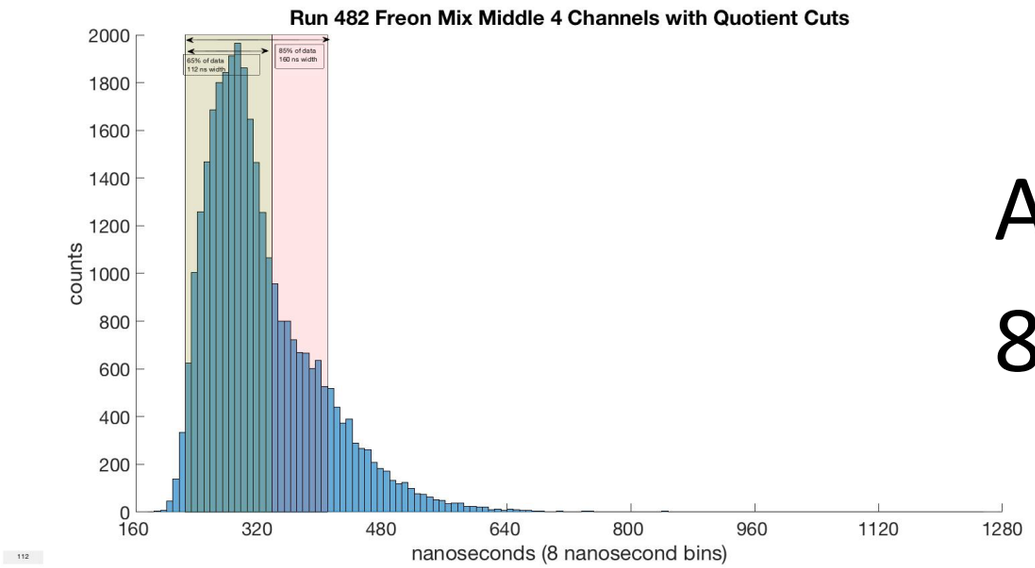
Drift time distributions



Ar:CO_2 80:20

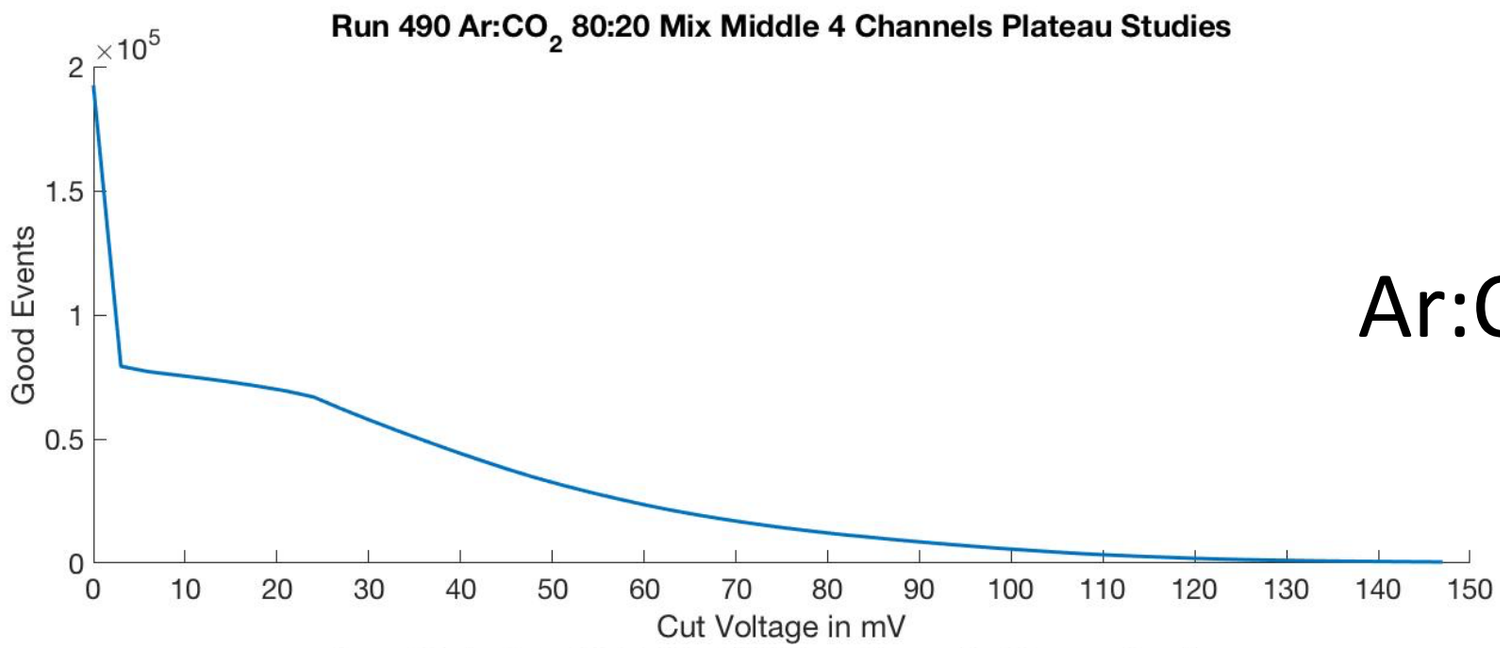


Ar:CO_2 90:10

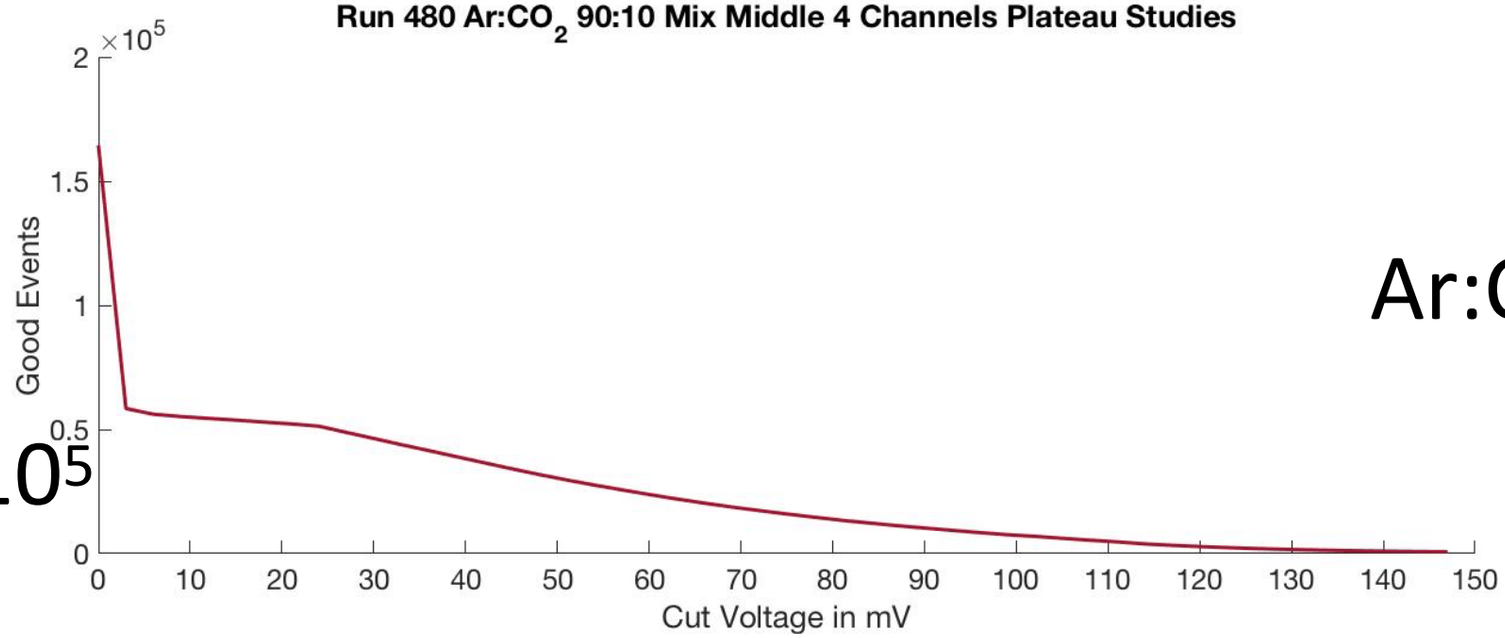


Ar:CO_2:CF_4 88:2:10

Relative efficiency versus threshold voltage at 10^5 gain



Ar:CO_2 80:20



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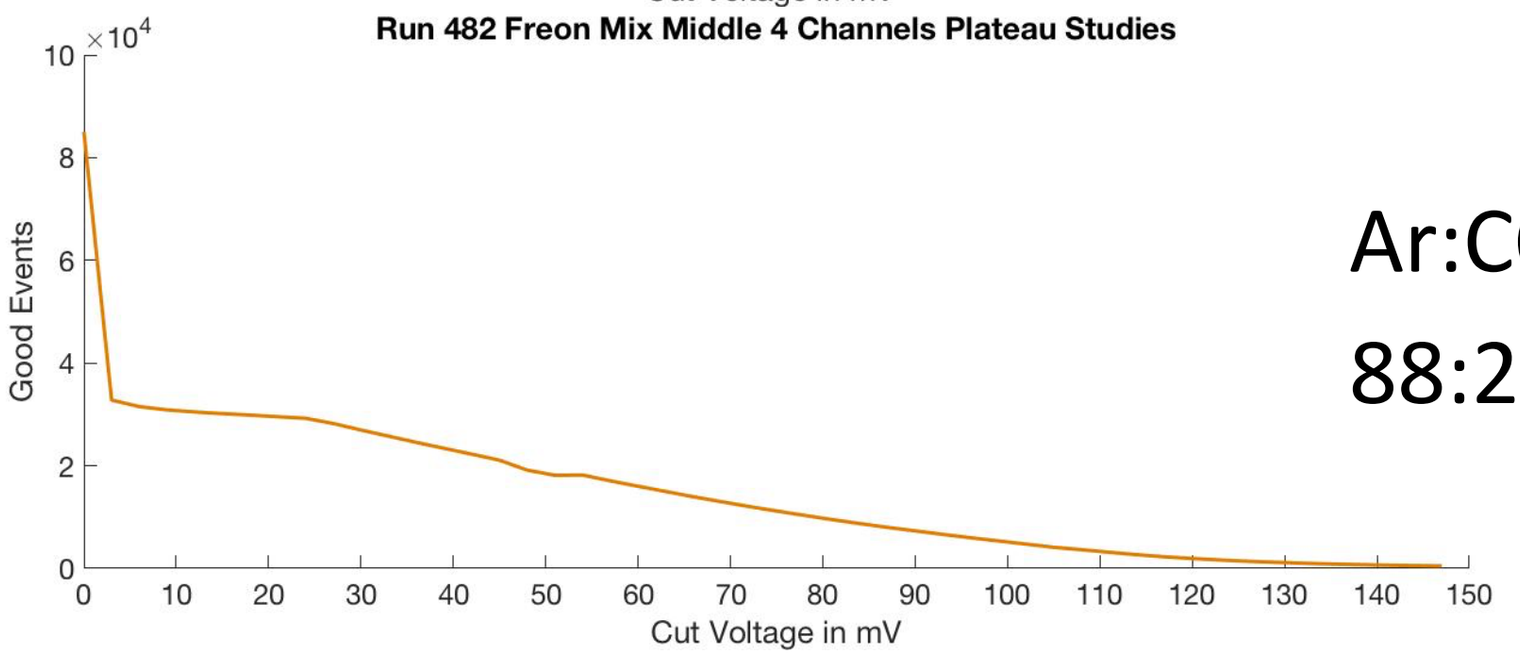

Ar:CO_2:CF_4 88:2:10

$\pi^{\pm}/\mu^{\pm}$ identification based on these FDC, FCAL and MWPC measurements

i. $E_{FCAL}/P_{kinematic-fit}$
ii. FCAL DOCA (distance between the shower and track projection)
iii. FCAL E9/E25 shower ratio (summed energies in 3x3 and 5x5 array of Pb-glass centered on the shower)
iv. likely include elasticity $= \left(E_1^{FCAL} + E_2^{FCAL}\right)/E_{tagger}$

and

v. distribution of hits in the MWPCs:
   a. Pions range out in the iron whereas muons continue through
   b. Sum hits along projected tracks through the MWPCs
   (p=3 GeV/c, multiple scattering $\sigma_{x,y} \approx 10\ cm$ at the last MWPC)

✓ $\pi^{\pm}$ neural-net response trained on CPP $\gamma A \rightarrow \rho^0 \rightarrow \pi^+\pi^-$ data: **We don't need to input MWPC efficiency for training, it's in the data.**

✓ $\mu^{\pm}$ neural-net response trained on Bethe-Heitler $\gamma A \rightarrow \mu^+\mu^-$ simulation: **We need to input MWPC efficiency for training**

Measurement of MWPC efficiency for input to $\mu^{\pm}$ neural net:

i. During run take data with a vertical scintillator paddle installed after the last MWPC pair

ii. Rotate wires in the last pair of MWPCs to be vertical