

St-4 Muon Prop Tubes

- Summer Work
 - June: Lei and Ming
 - July : Andrew, Christine, Lei and Ming
 - Checked all modules with Ar/CO₂ (80/20)
- Installation plan
- Background rate

July 2010 @NM4



8/5/10

Ming X. Liu LANL

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Ion absorbers



80-20 based ST-4 Prop Tube Frame will
look like this one...



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Prop Tube Lifting Points

(similar to ST-2 chambers)



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Ming X. Liu LA

Assembling area



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6

Installation – drop in w/ crane



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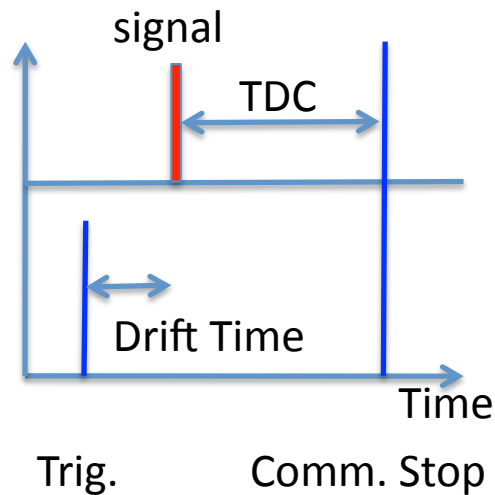
7

TDC spectra: Mod. #35

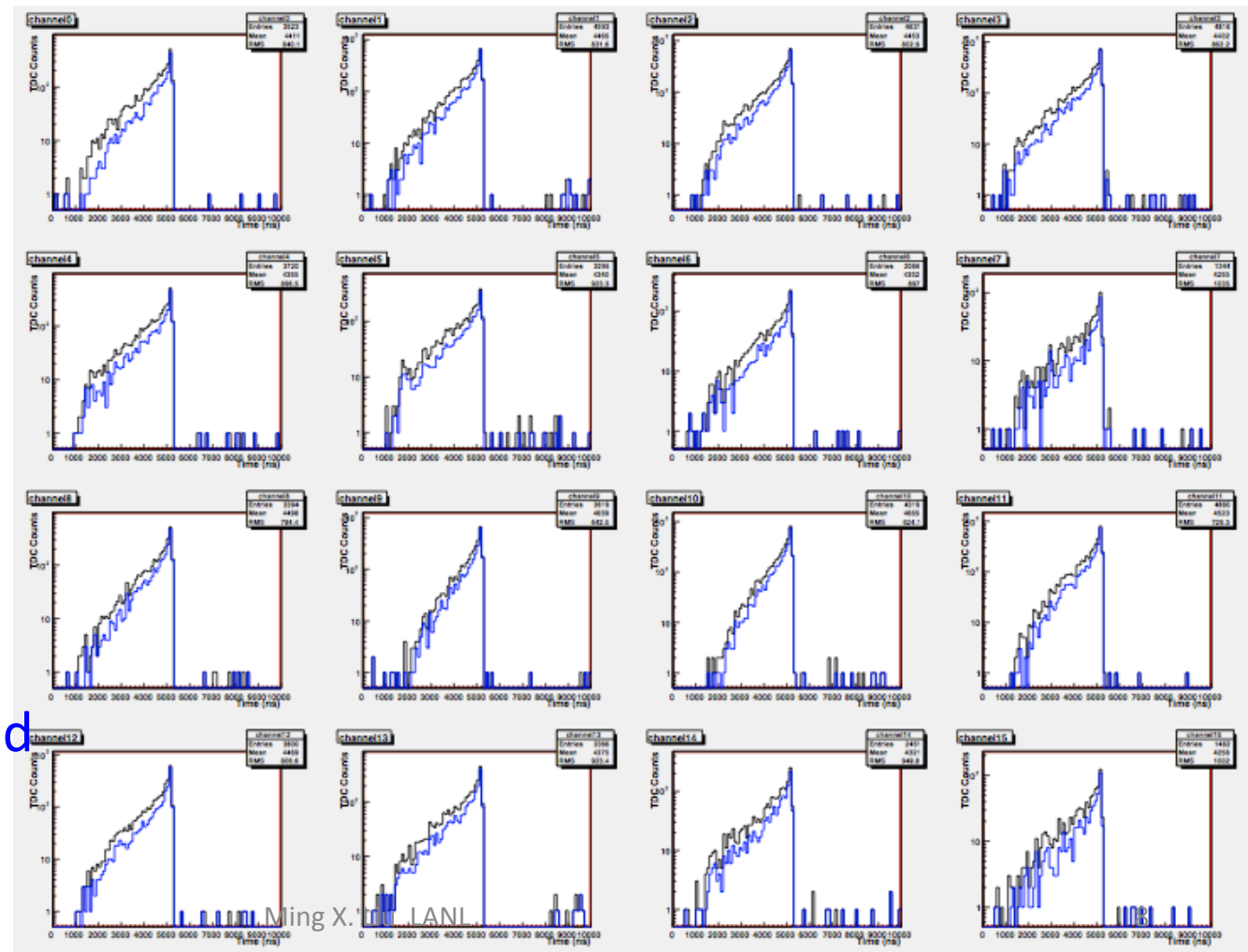
Ar/Co2 =80/20 HV=1900V

$$\Delta T_{\max} \sim 2 \mu\text{s}$$

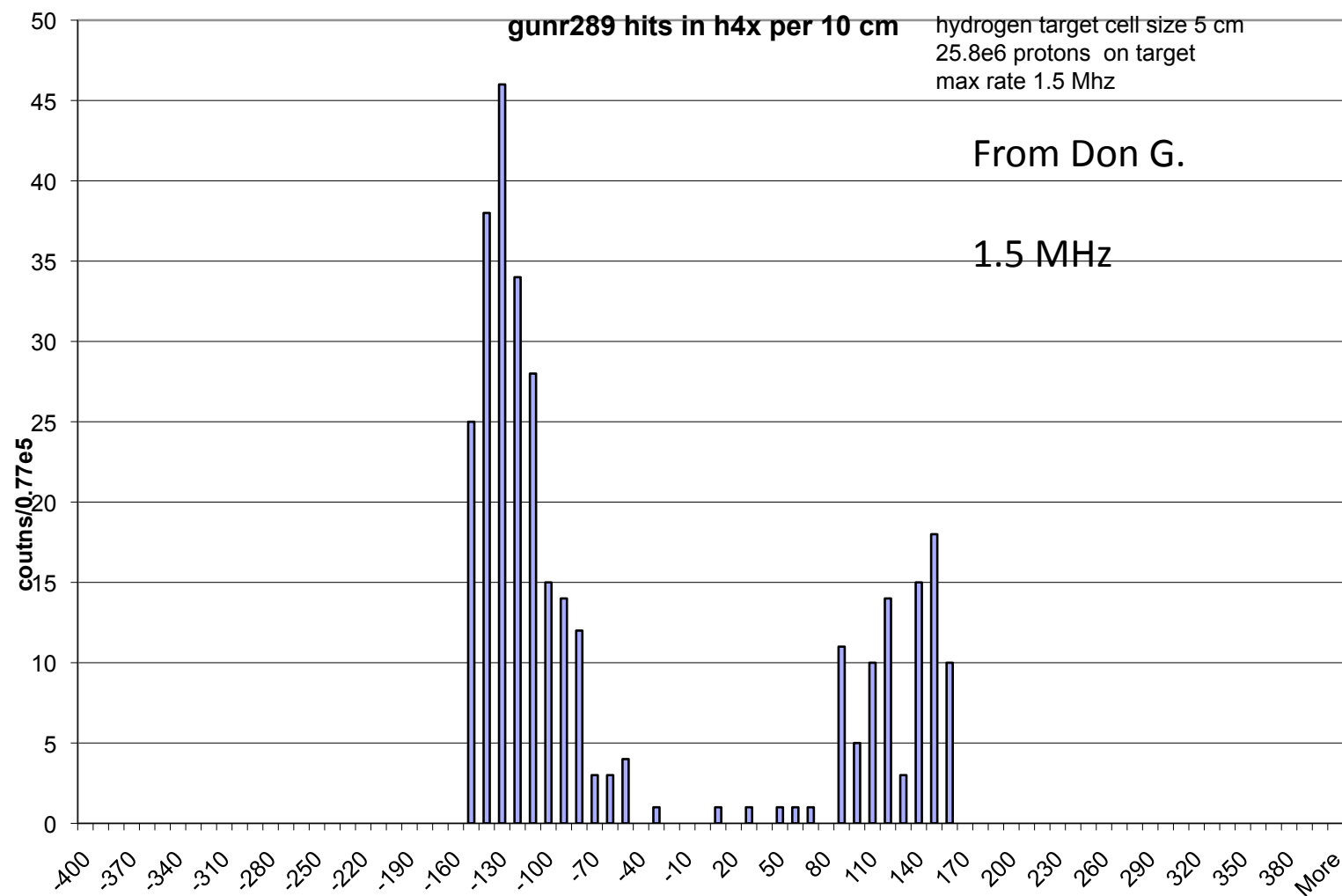
Thanks Kaz!



- BLK = all
- BLUE = 1st sample only, rings removed



Background (I)



Max. Drift Time and Background Rate

- Background rates set the maximum Drift time

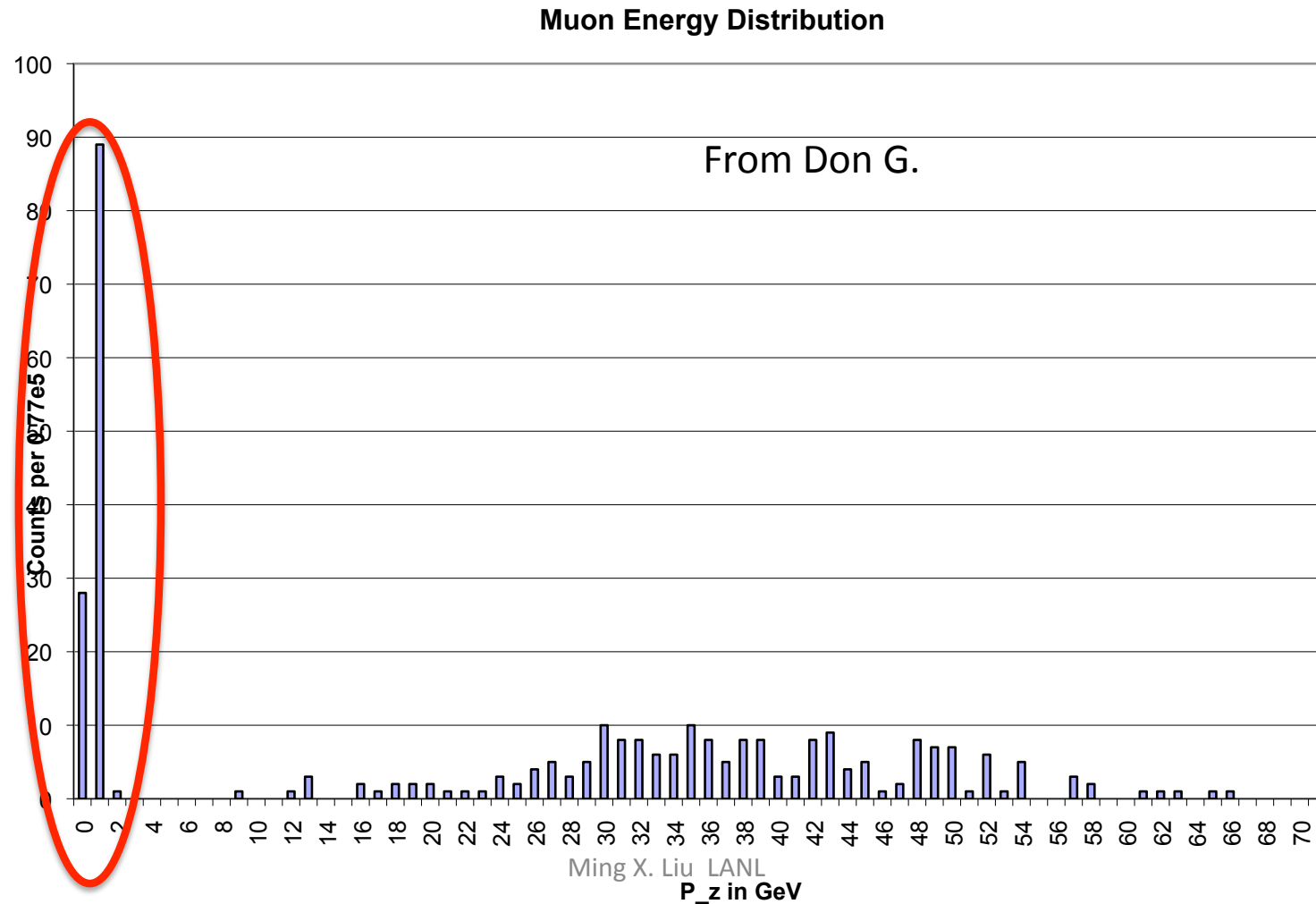
$$\Delta T_{Max} < \frac{1}{f_{BG}} = \frac{1}{1.5 MHz} = 0.67 \mu s$$

- Can we reduce the BG?

Background rate (II)

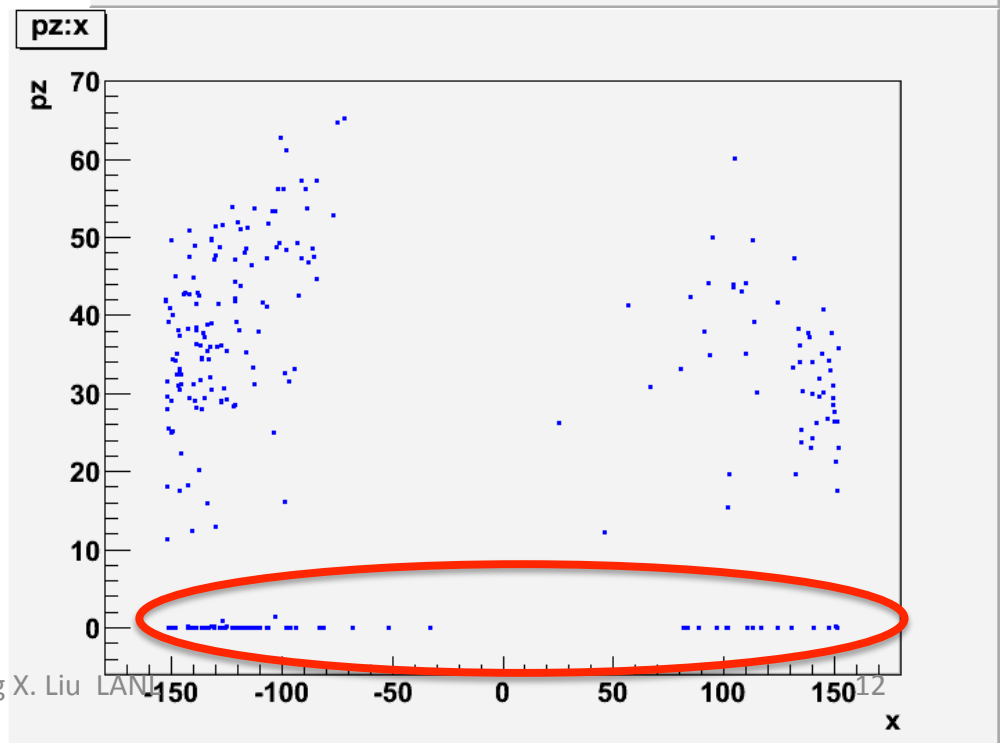
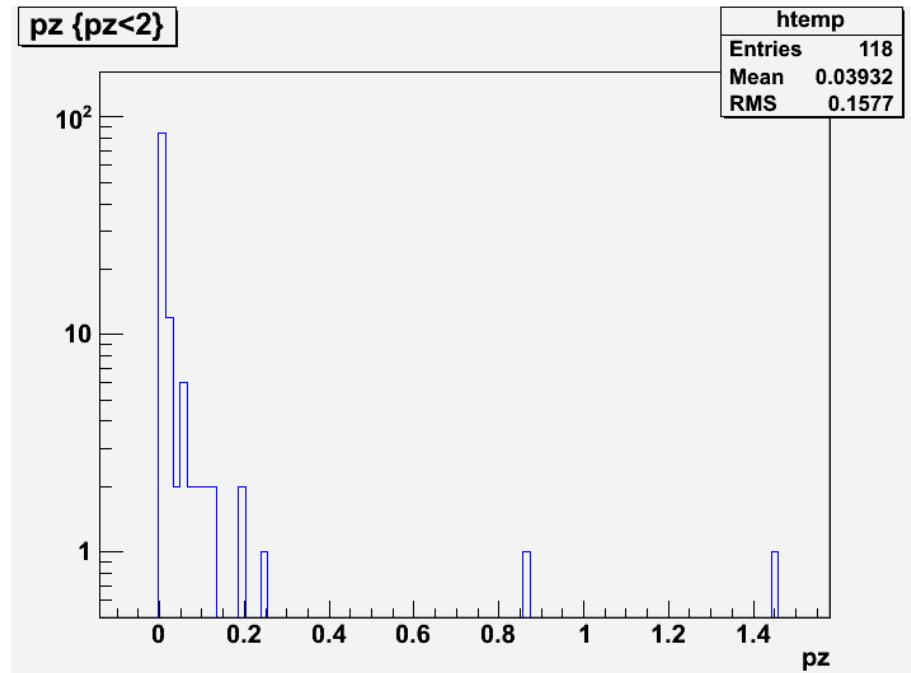
muon energy spectrum

- 37% low energy muons, $P < 1.5$ GeV, can be removed by thick (1 m) ion blocks, $E_{\text{loss}} \sim 1.5\text{GeV}$



More on background

- Pz vs X distribution
- If $p_z < 1\text{GeV}$ removed
 - Rate = $1.5 * 0.63$
= 0.95MHz
- Like to have more MC samples

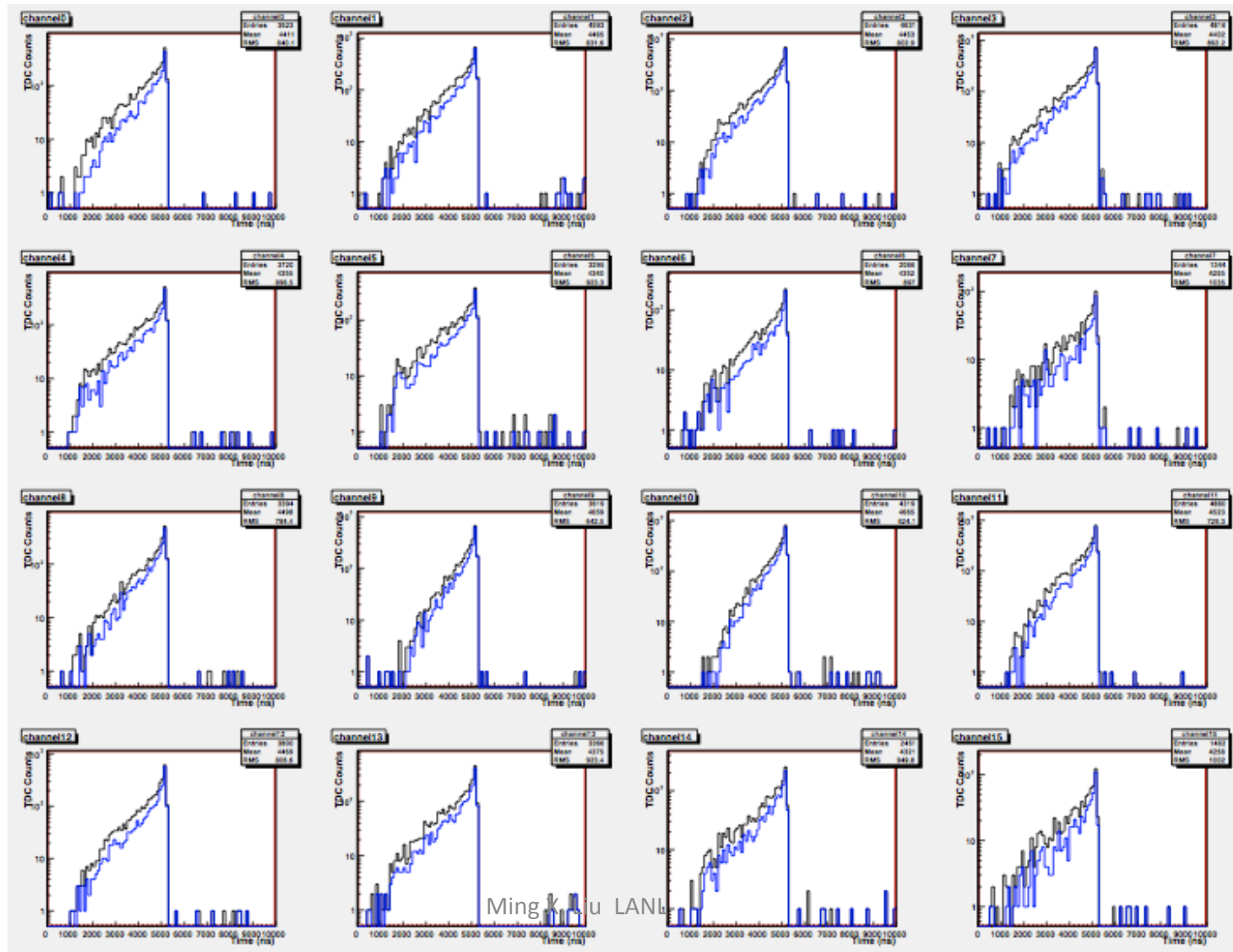


Some Issues

- More absorbers?
 - Current ion blocks don't cover the whole detectors
 - More ion or concrete blocks?
- Schedule of the I-beam support frame
- Schedule of TDC electronics and DAQ
- Check background rate with test beam, when?
- Which Gas?



First TDC Readout



First TDC readout

