

Run 16 MXQ VPD Resolution

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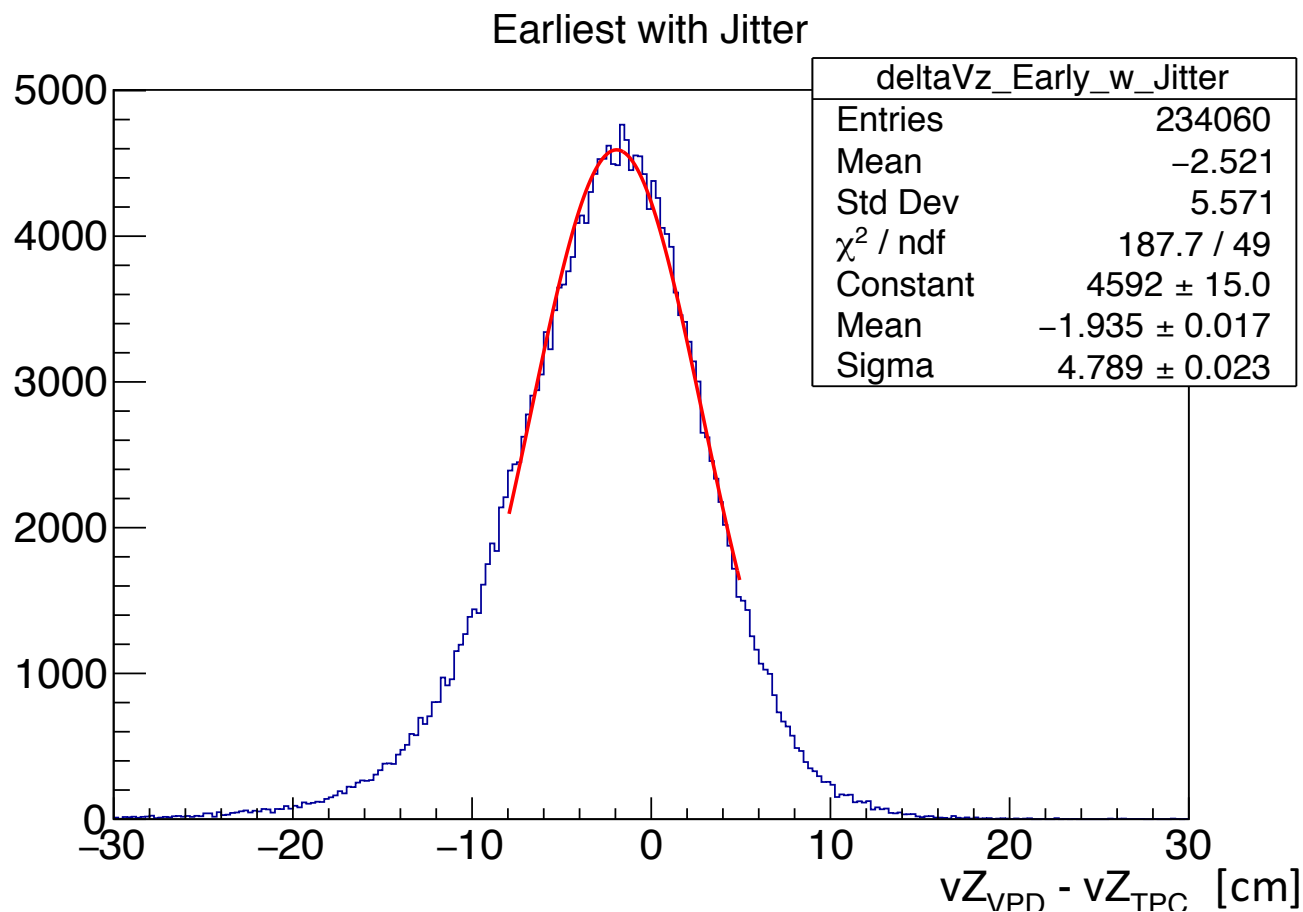
Rice U.

Dataset

- Run16 AuAu Di-muon trigger fast offline data
 - Run # : 17040067
 - Run # : 17040068
- Event selection:
 - $|\text{Offline VPD_vZ} - \text{TPC_vZ}| < 3.0$
 - $\text{Sqrt}(vX^2 + vY^2) < 1.0$

MXQ

Current Online VPD Resolution



Method:

Take earliest TAC
on the west and
east.

Where:

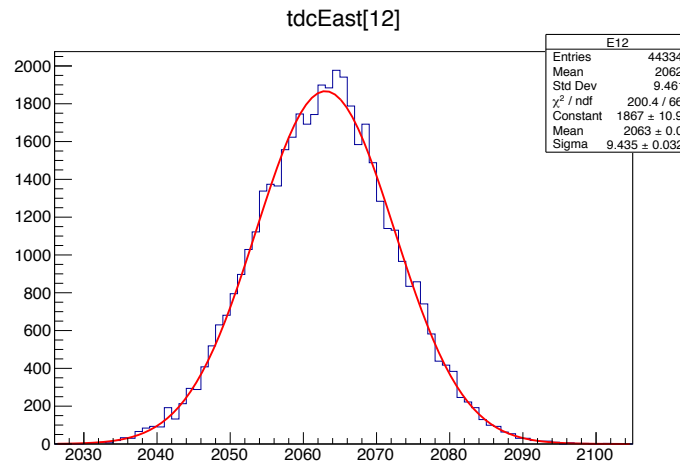
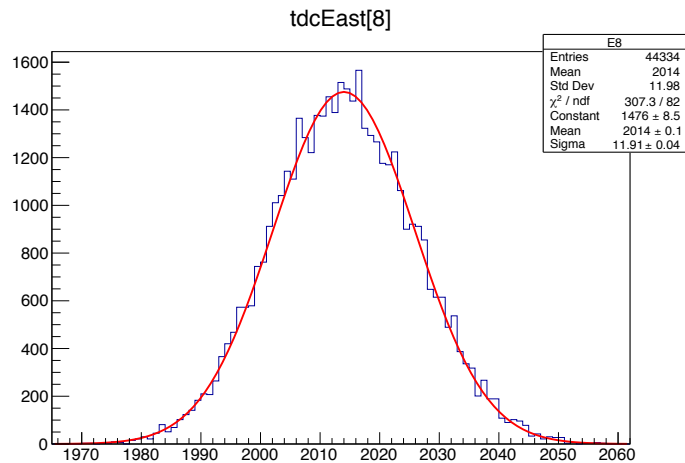
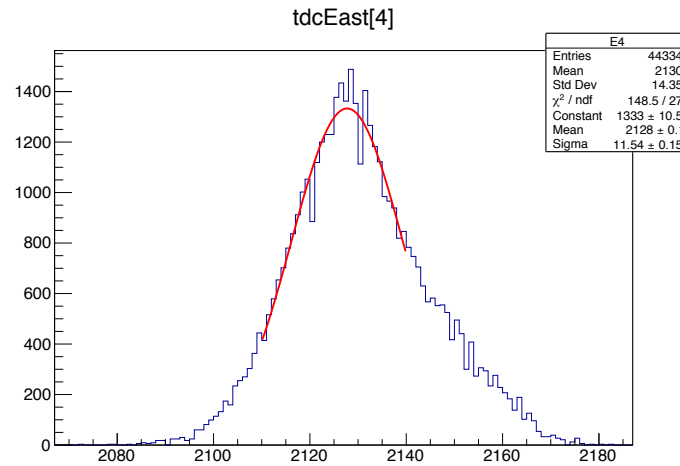
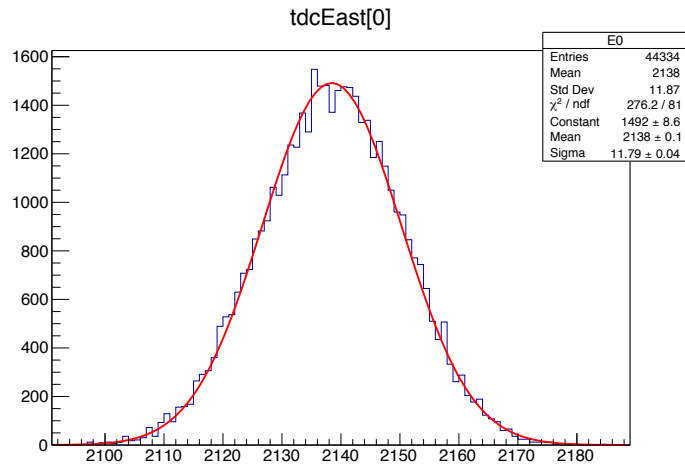
$300 < \text{TAC} < 3000$

$10 < \text{ADC}$

Common mode
jitter is not
removed

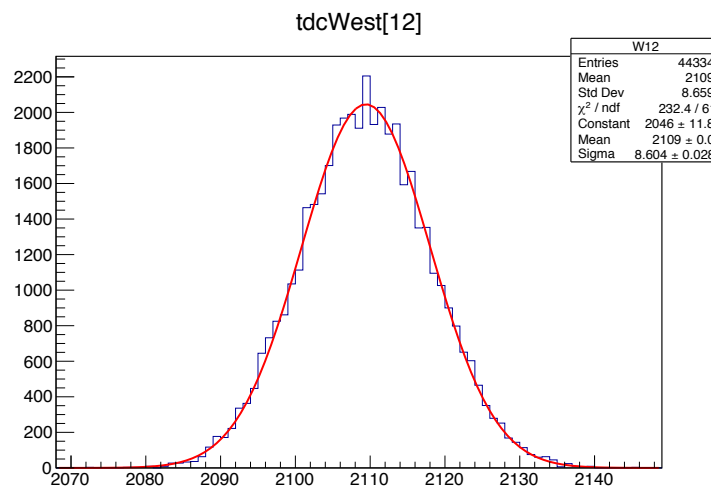
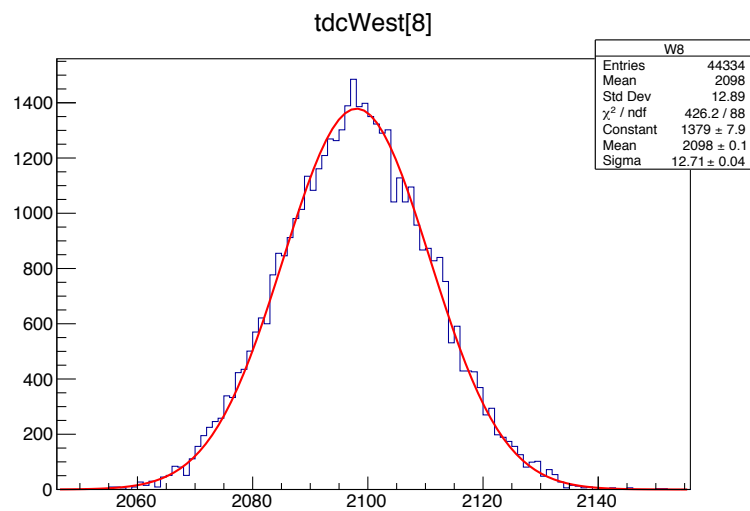
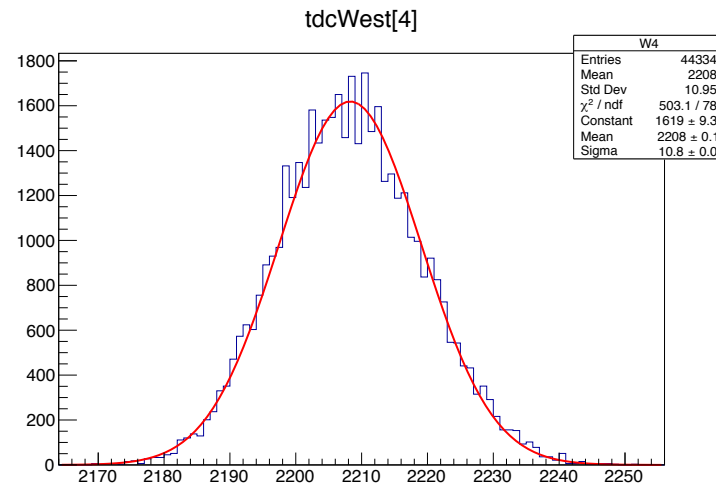
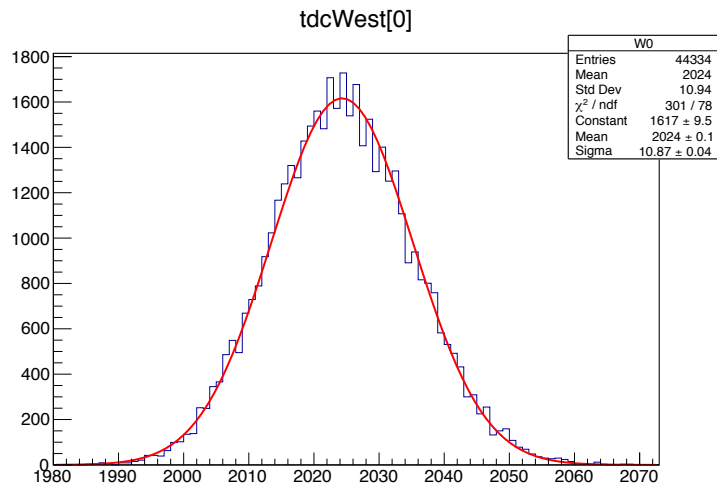
MXQ

East Pulsar Channels

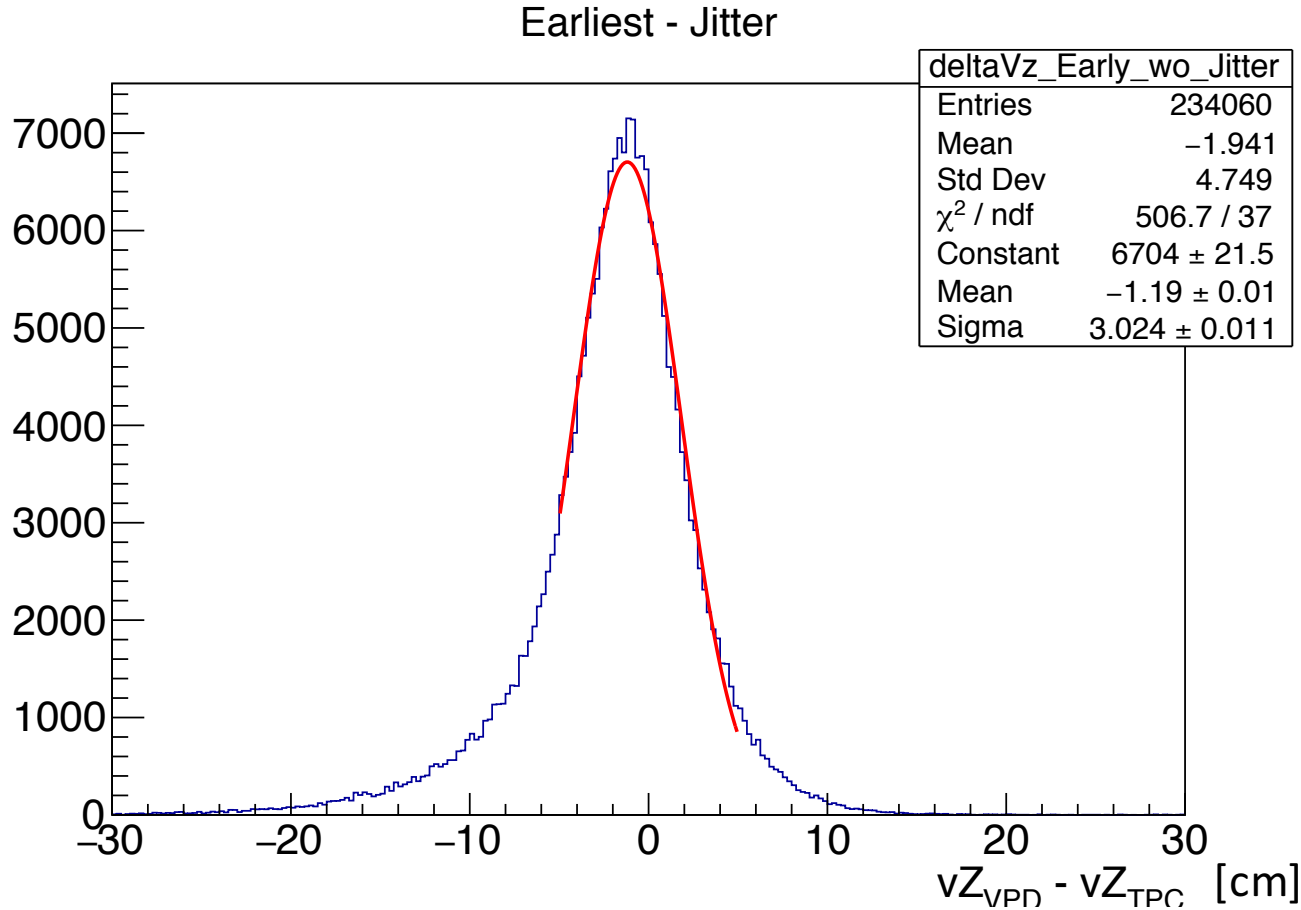


MXQ

West Pulsar Channels



Common mode Jitter subtraction



Method:

- 1) Slew correct
- 2) subtract noise for the given daughter card
- 3) Select Earliest TAC on west and east

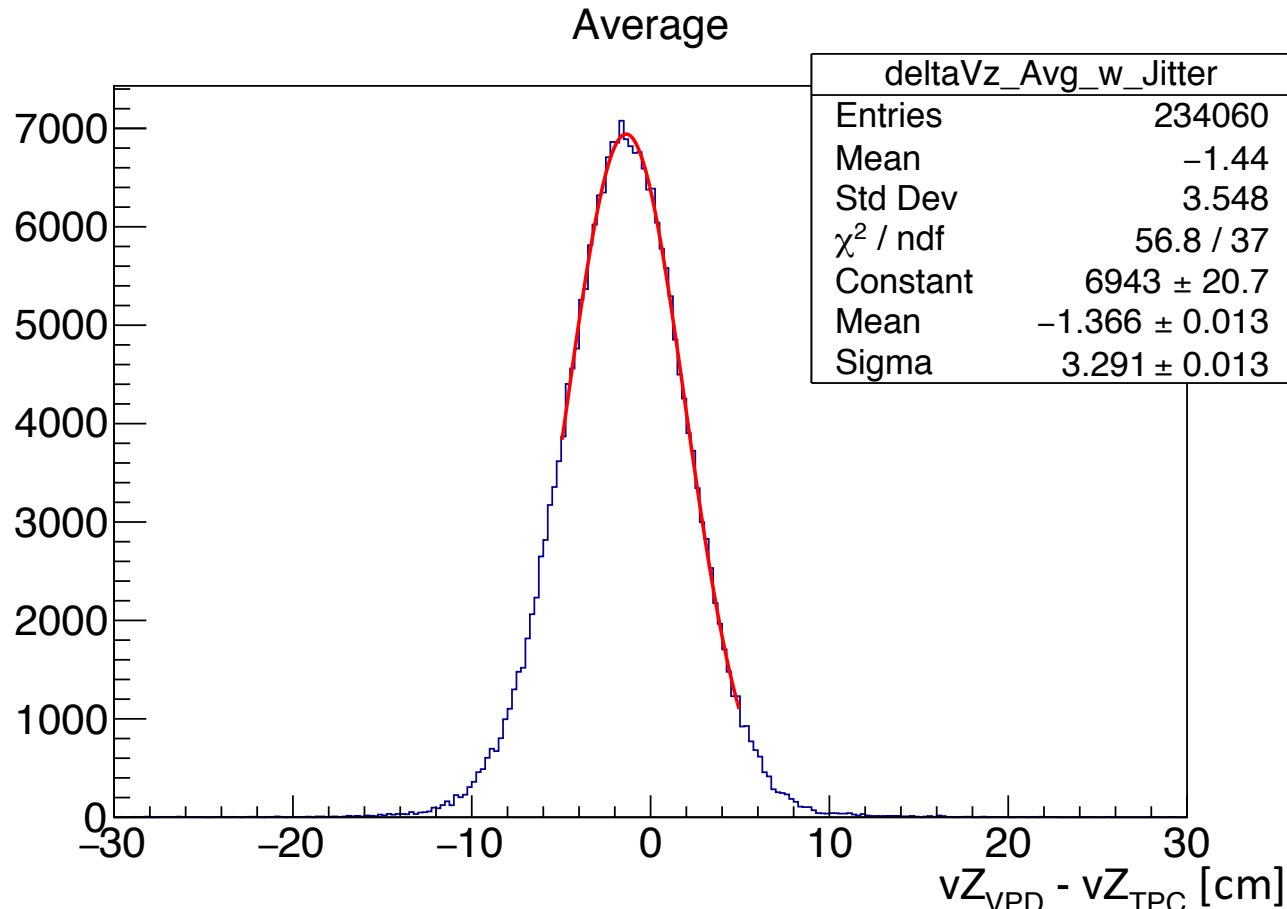
Where:

$300 < \text{TAC} < 3000$

$10 < \text{ADC}$

Improves from 4.7 cm to 3.0 cm

Mean **without** jitter subtraction



Method:

- 1) Slew correct
- 2) Calculate average
TAC on east and
west

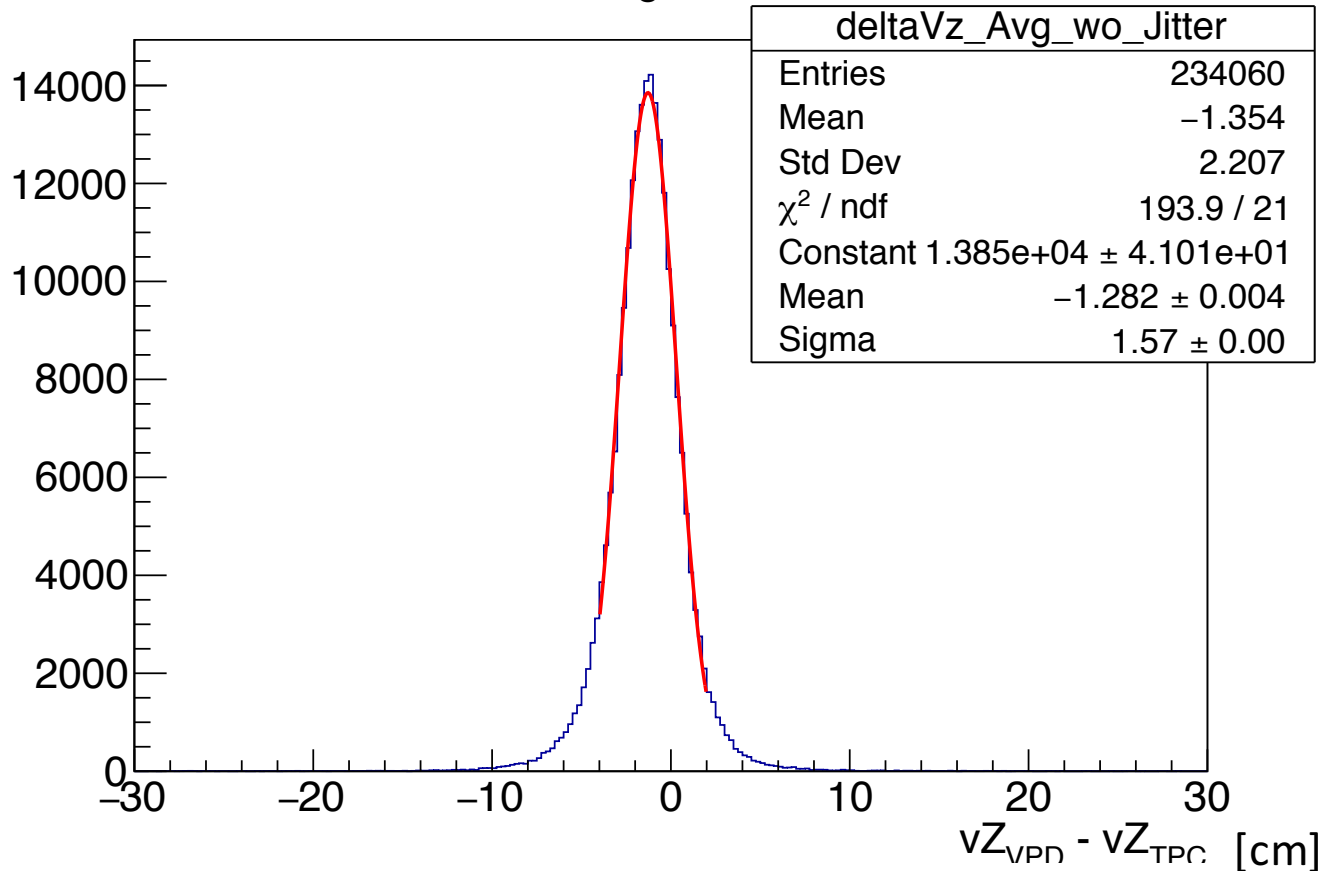
Where:

$300 < \text{TAC} < 3000$
 $10 < \text{ADC}$

Notice that this is not quite as good as the
“earliest TAC – jitter”

Mean with jitter subtraction

Average - Jitter



Method:

- 1) Slew correct
- 2) subtract noise for the given daughter card
- 3) Calculate average TAC on east and west

Where:

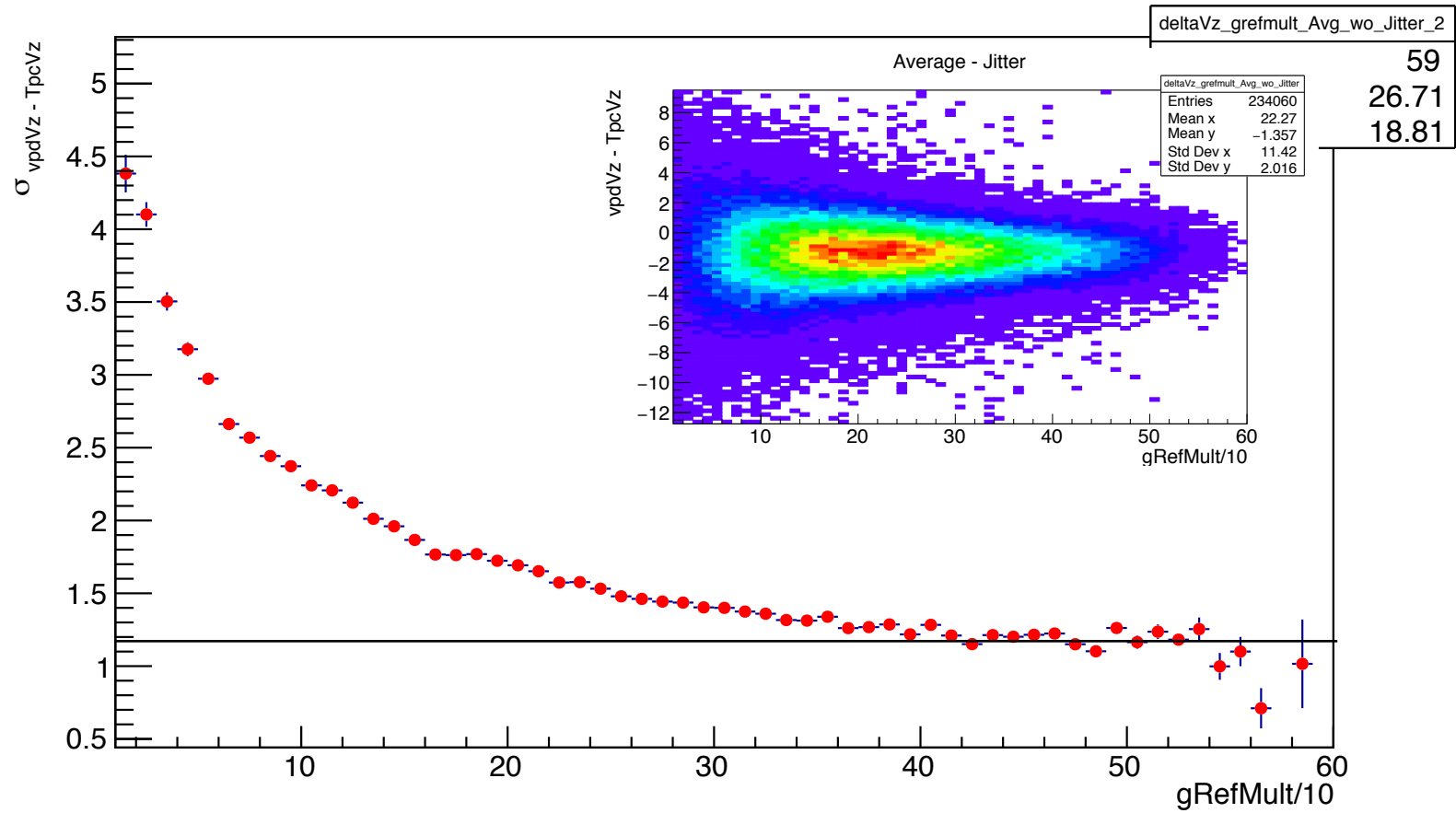
$300 < \text{TAC} < 3000$

$10 < \text{ADC}$

Removing the common mode jitter
improves the mean method resolution
from 3.3 cm to 1.6cm

gRefMult Dependence

Mean wo Jitter vs. gRefMult



Conclusion

- **Common mode jitter subtraction alone improves the earliest TAC method resolution from 4.7cm to 3.0cm**
- **The mean TAC method improves the resolution from 4.7 cm to 3.3 cm**
- **Common mode jitter subtraction and the mean TAC method together improve the resolution from 4.7cm to 1.5 cm**