Run 16 BBQ VPD Resolution

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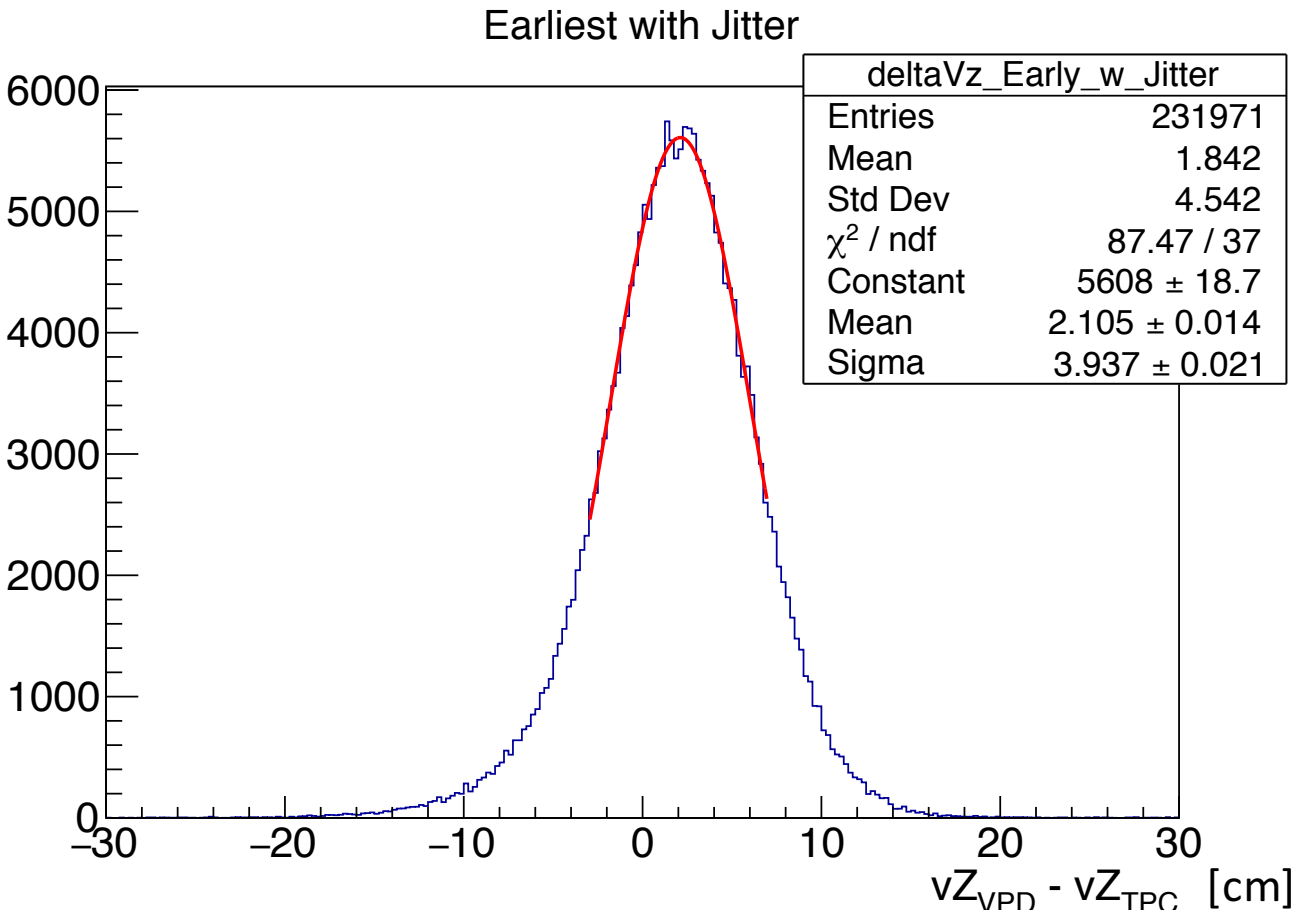
Rice U

Dataset

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

BBQ
Current Online VPD Vertex Resolution

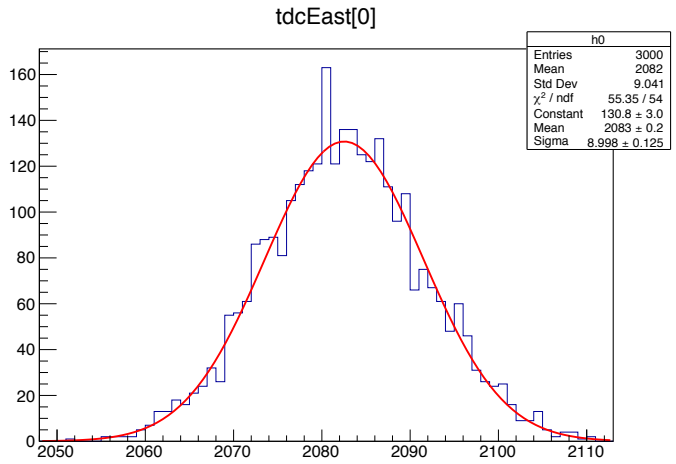


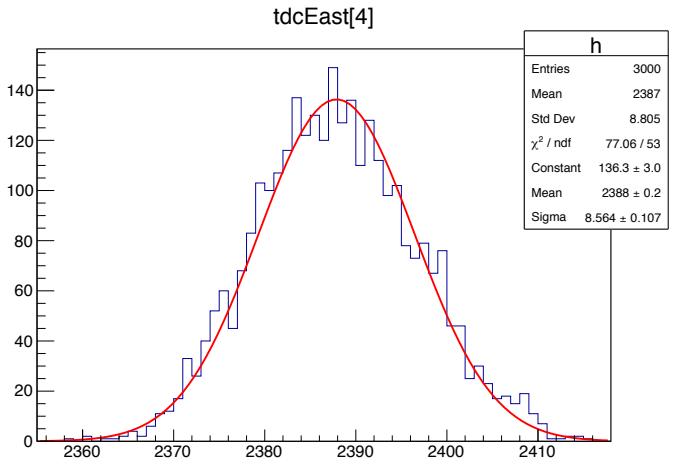
Method:
Take earliest TAC on the west and east.

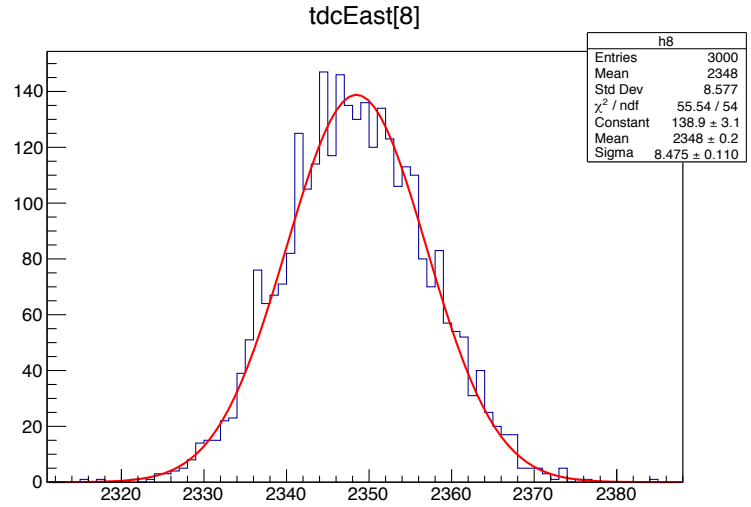
Where:
300 < TAC < 3000
10 < ADC

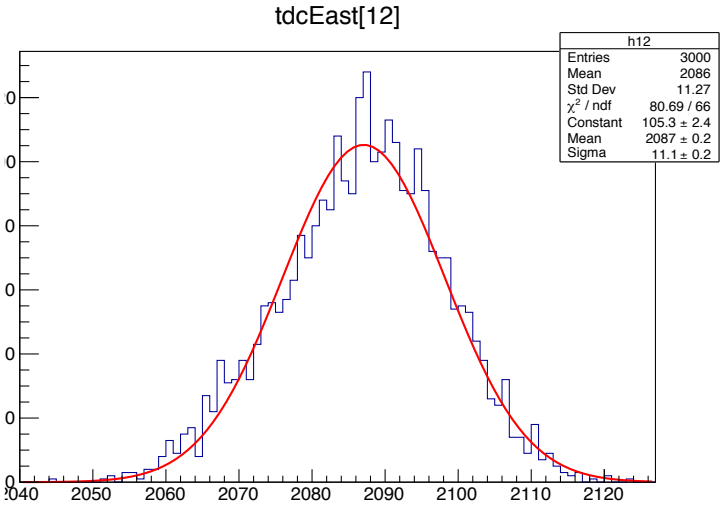
Common mode jitter is not removed

BBQ
East Pulser Channels

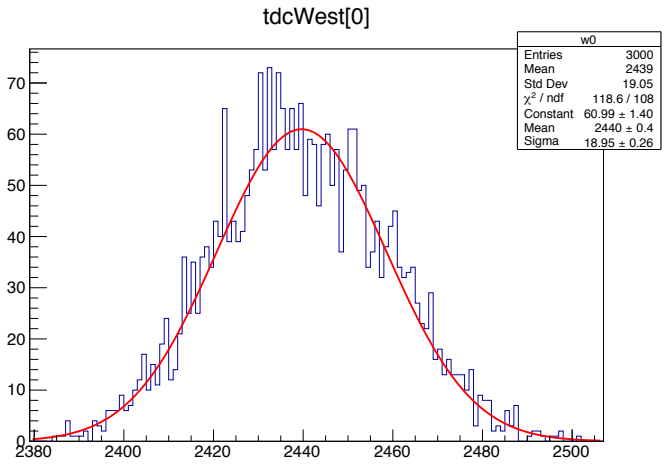


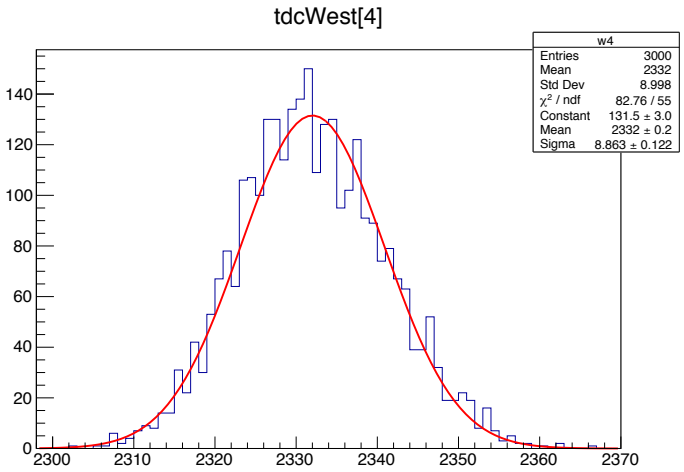


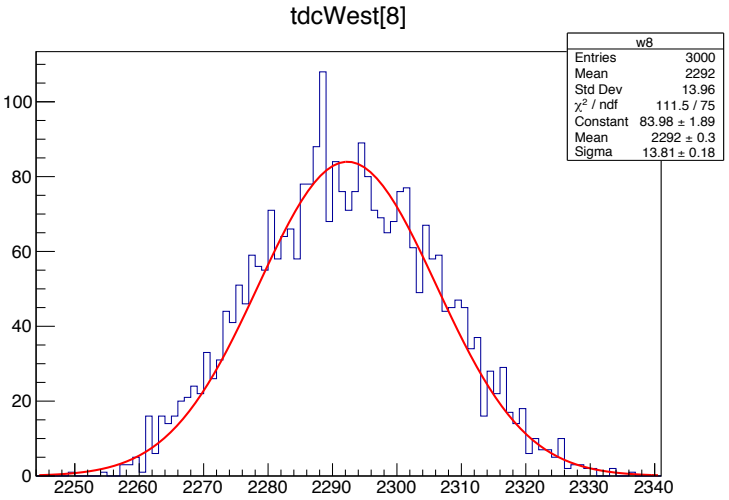


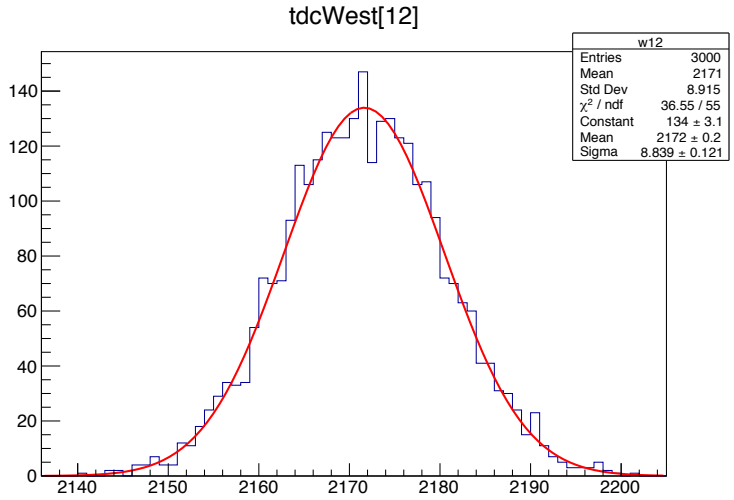


BBQ
West Pulser Channels

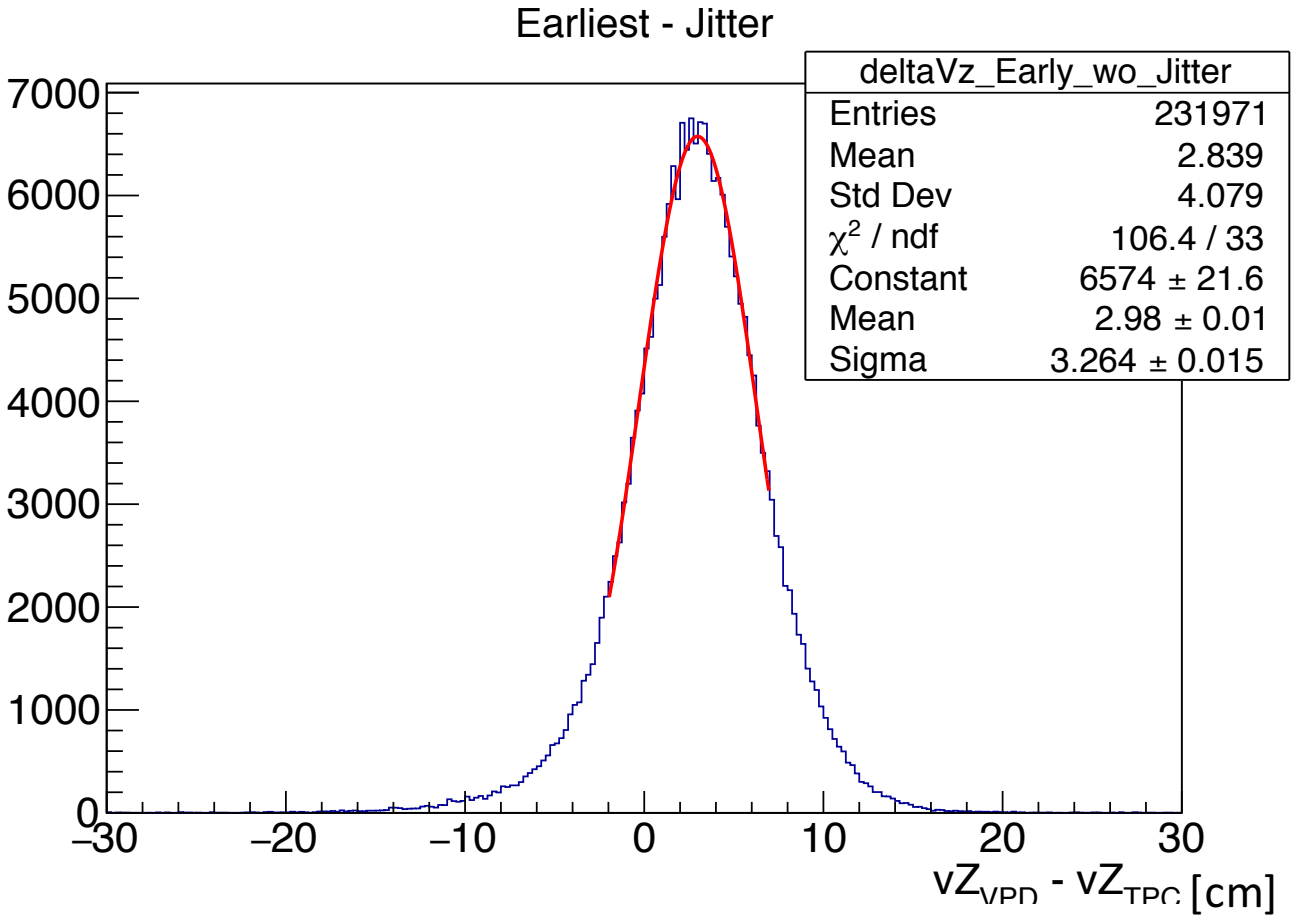








Common mode Jitter subtraction



Method:

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

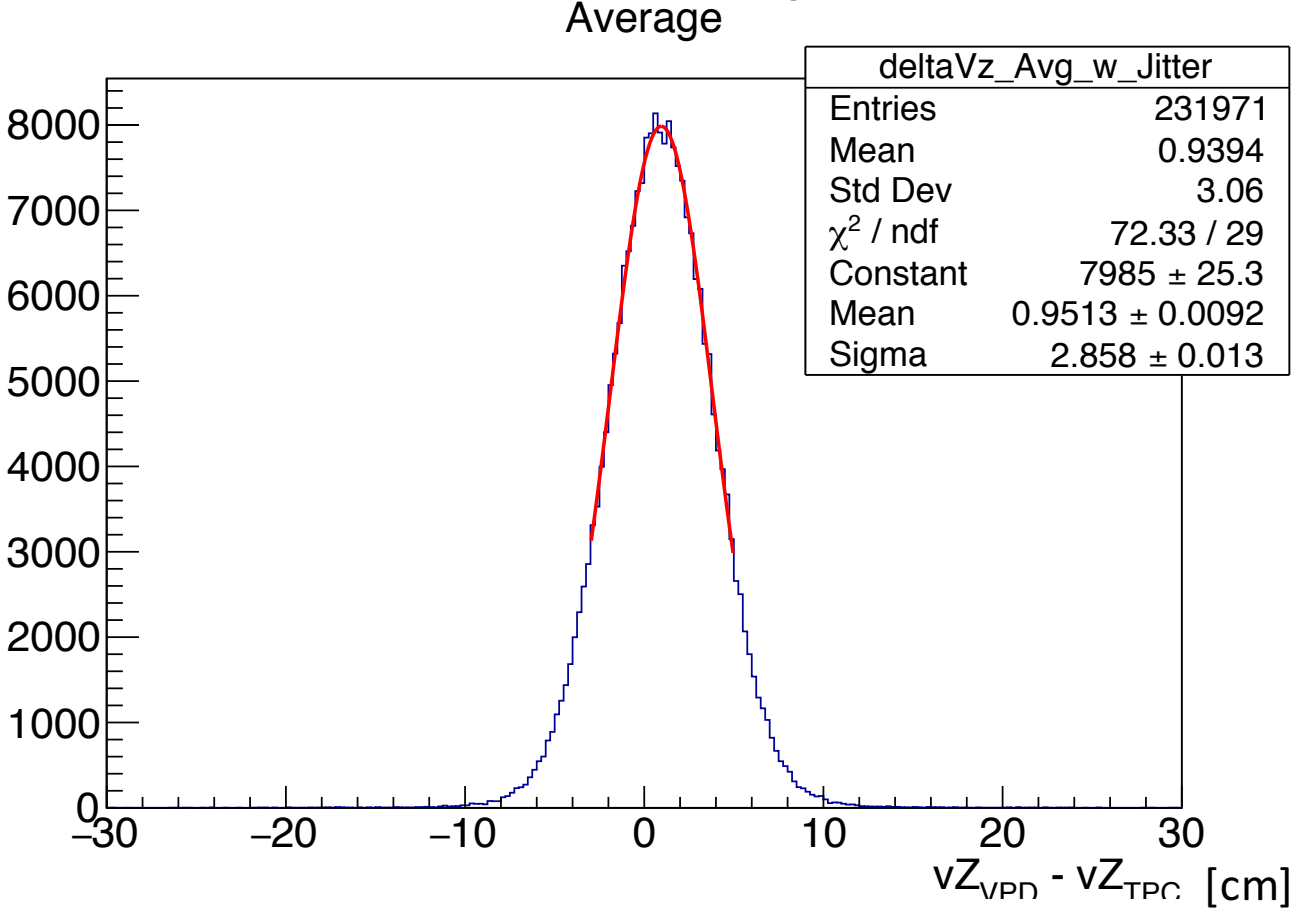
Where:

300 < TAC < 3000

10 < ADC

Improves from ~4.0 cm to 3.3 cm

Mean **without** jitter subtraction



Method:

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

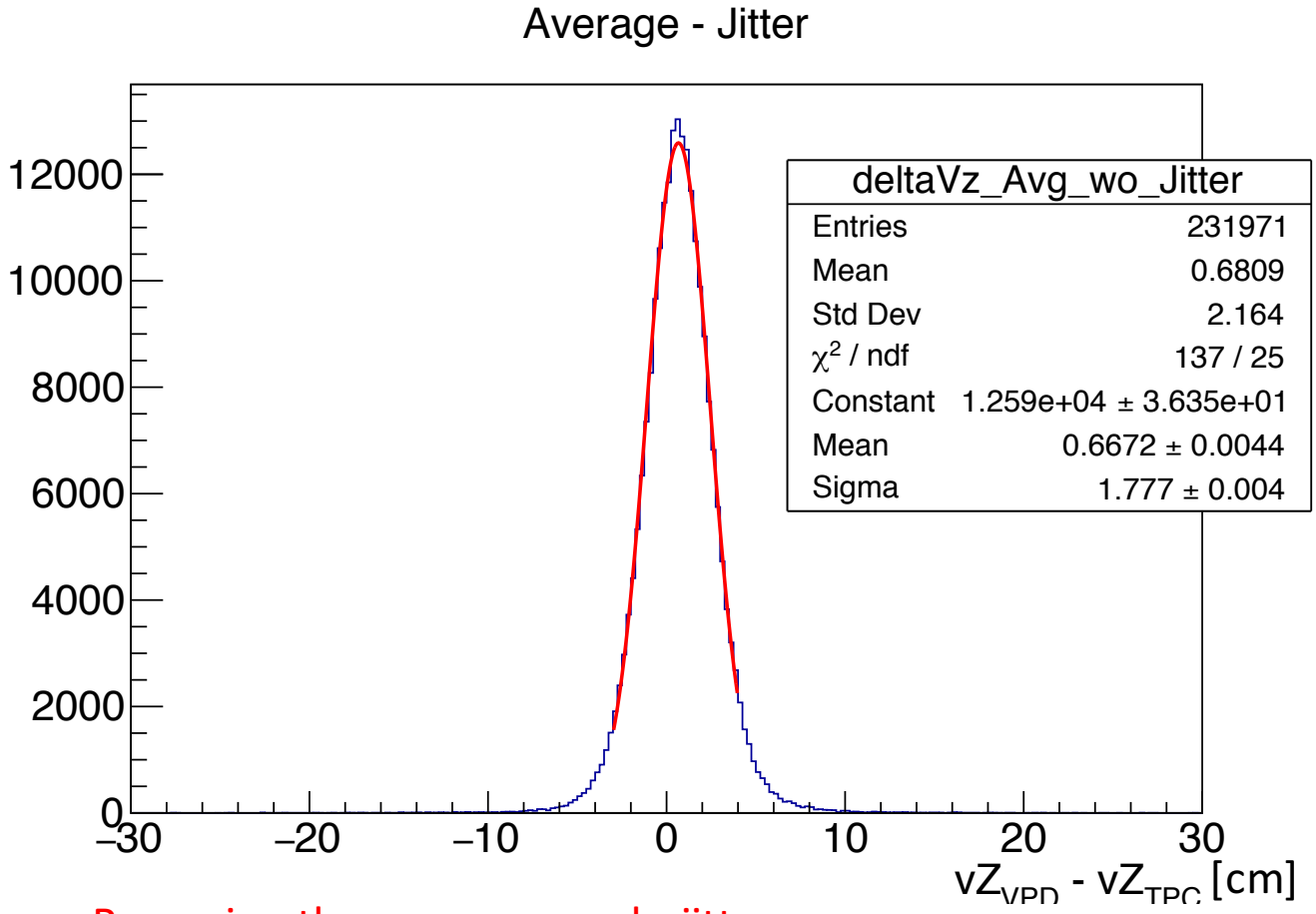
Where:

300 < TAC < 3000

10 < ADC

Improves from ~4.0 cm to 2.8 cm

Mean **with** jitter subtraction



Removing the common mode jitter improves the mean TAC method resolution from 2.8 cm to 1.77 cm

Method:

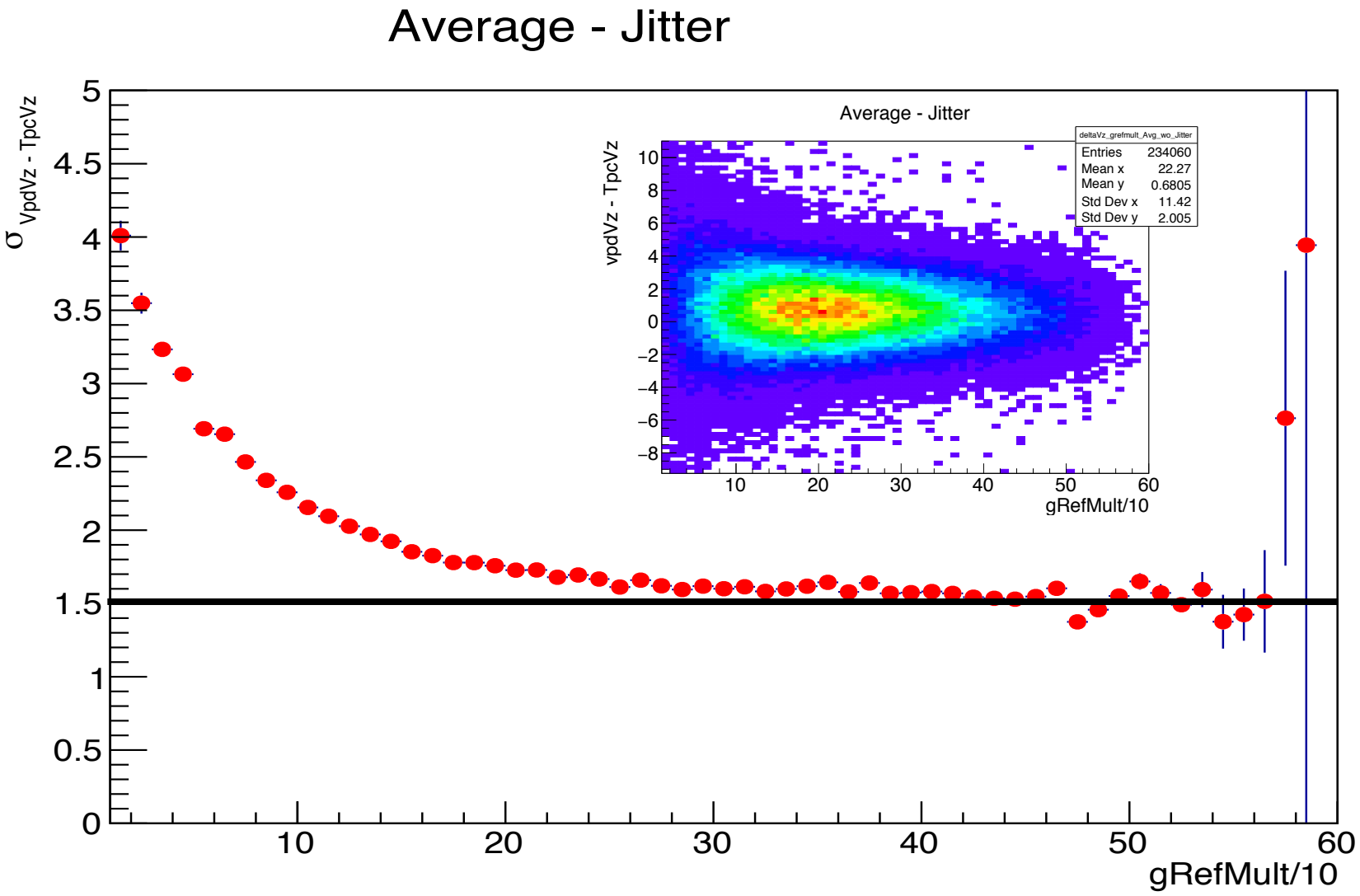
1) Slew correct
2) subtract noise for the given daughter card
3) Calculate average TAC on east and west

Where:

300 < TAC < 3000

10 < ADC

gRefMult dependence



Conclusion

- **Common mode jitter subtraction alone improves the earliest TAC method resolution from 4.0cm to 3.3cm**
- **The mean TAC method improves the resolution from 4.0 cm to 2.8 cm**
- **Common mode jitter subtraction and the mean TAC method together improve the resolution from 4.0 cm to 1.77 cm**