

Three bar time resolution test update

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Work Abstract in JLab

- Install the two PMTs to the third scintillator bar
- Build three bar time resolution test setup
- Now CODA only works with TDC module, NO FADC data
- Electronics works well

Three bar test method



$$T = \frac{t0+t3+t2+t5}{4} - \frac{t1+t4}{2}$$

t3

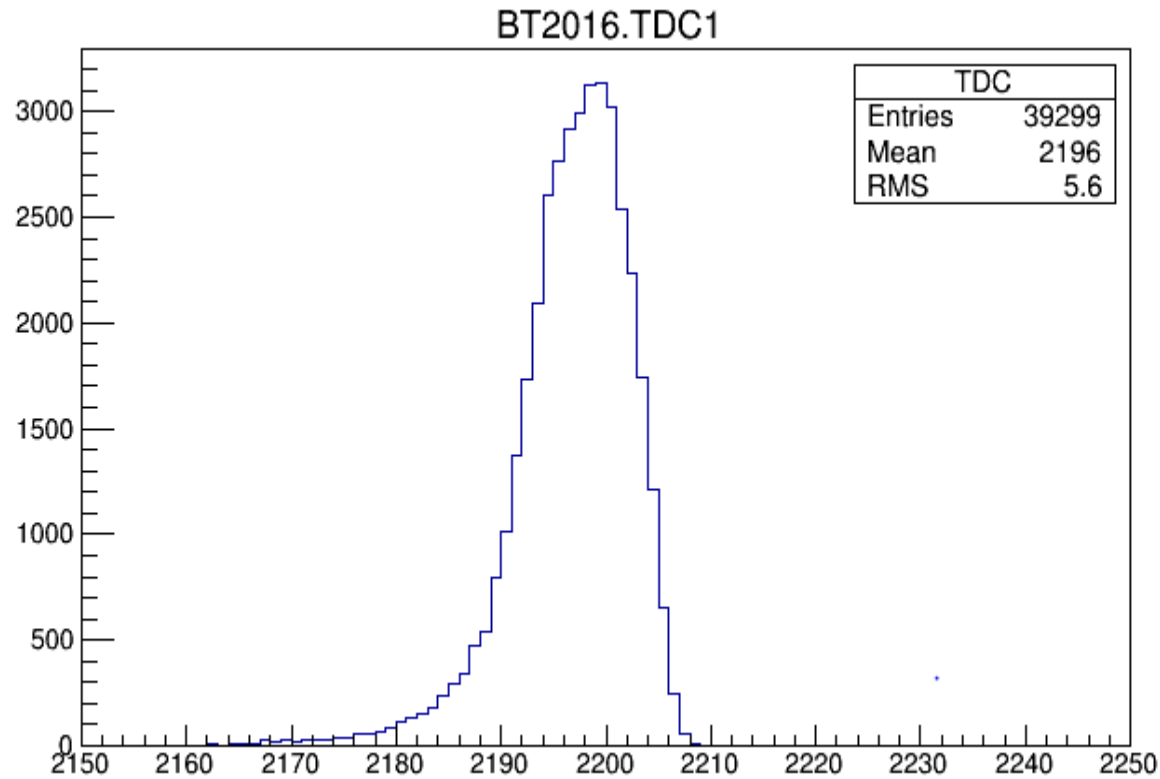
t4

t5

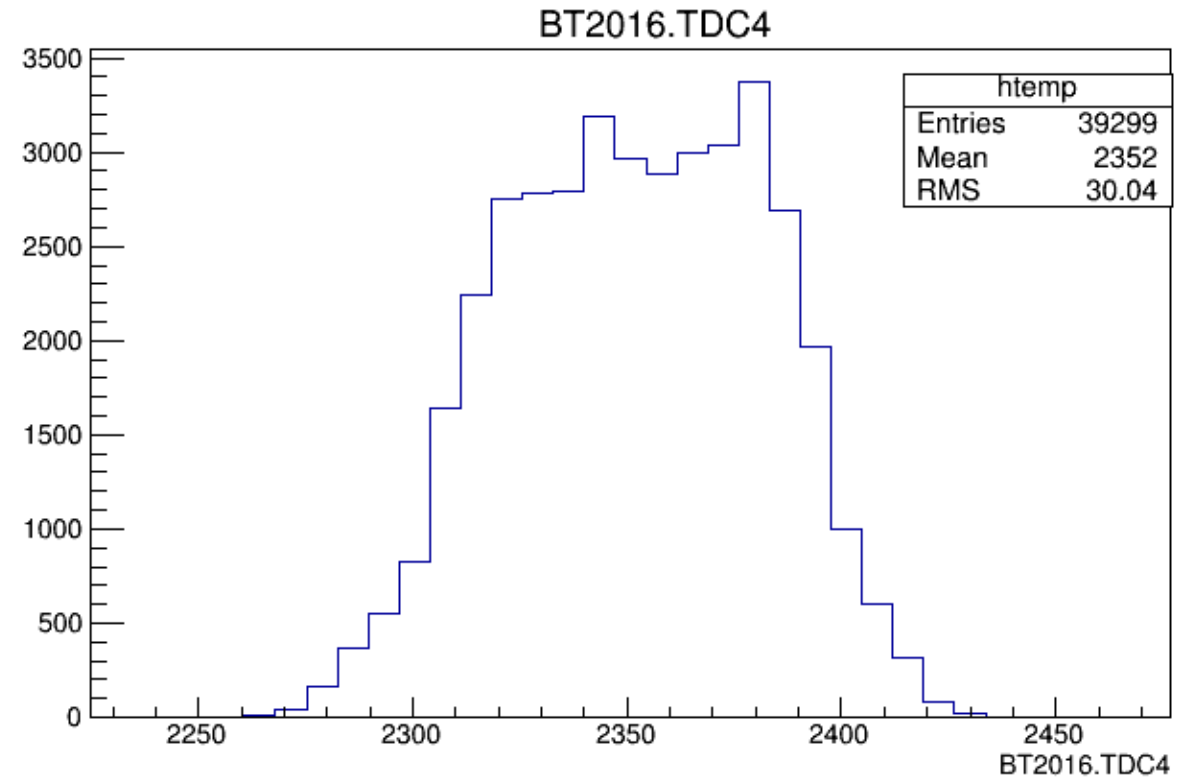
$$\sigma = \sqrt{\frac{2}{3}} \sigma_T$$

Using coincidence of six PMTs signal, and got about 40k cosmic events in 22h, the rate about 0.5Hz.

Both side time resolution in middle bar



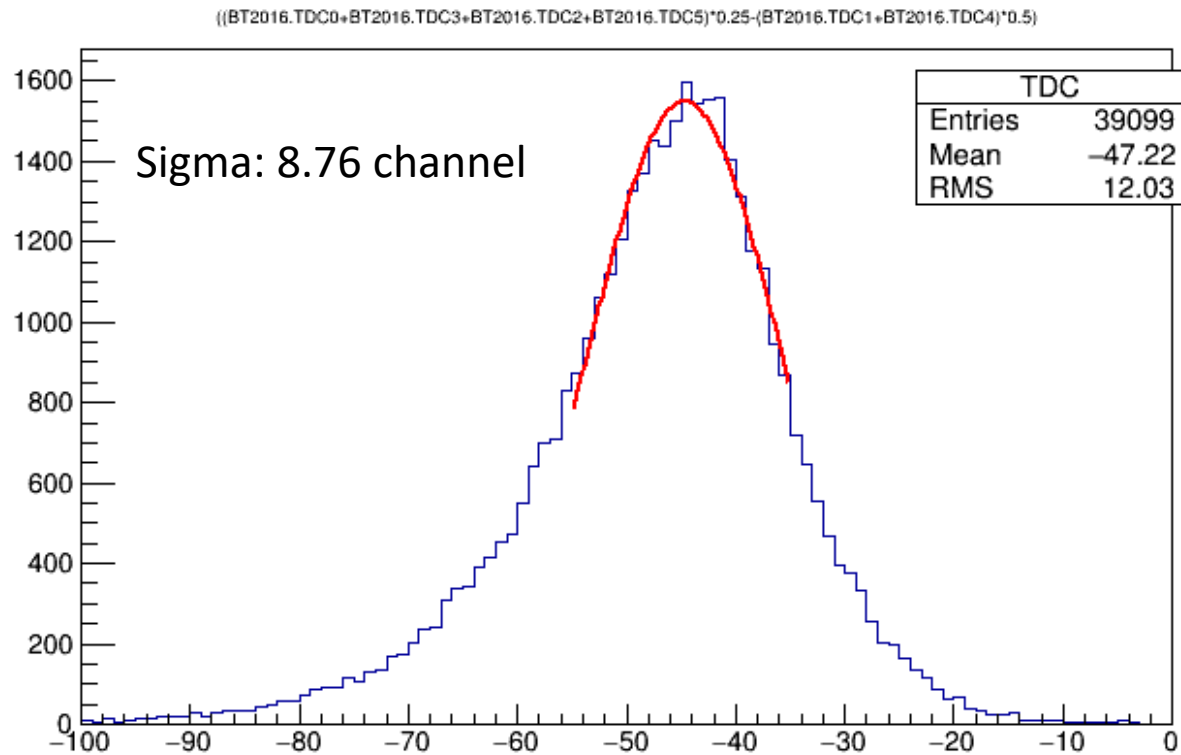
Left side PMT(as trigger time reference)



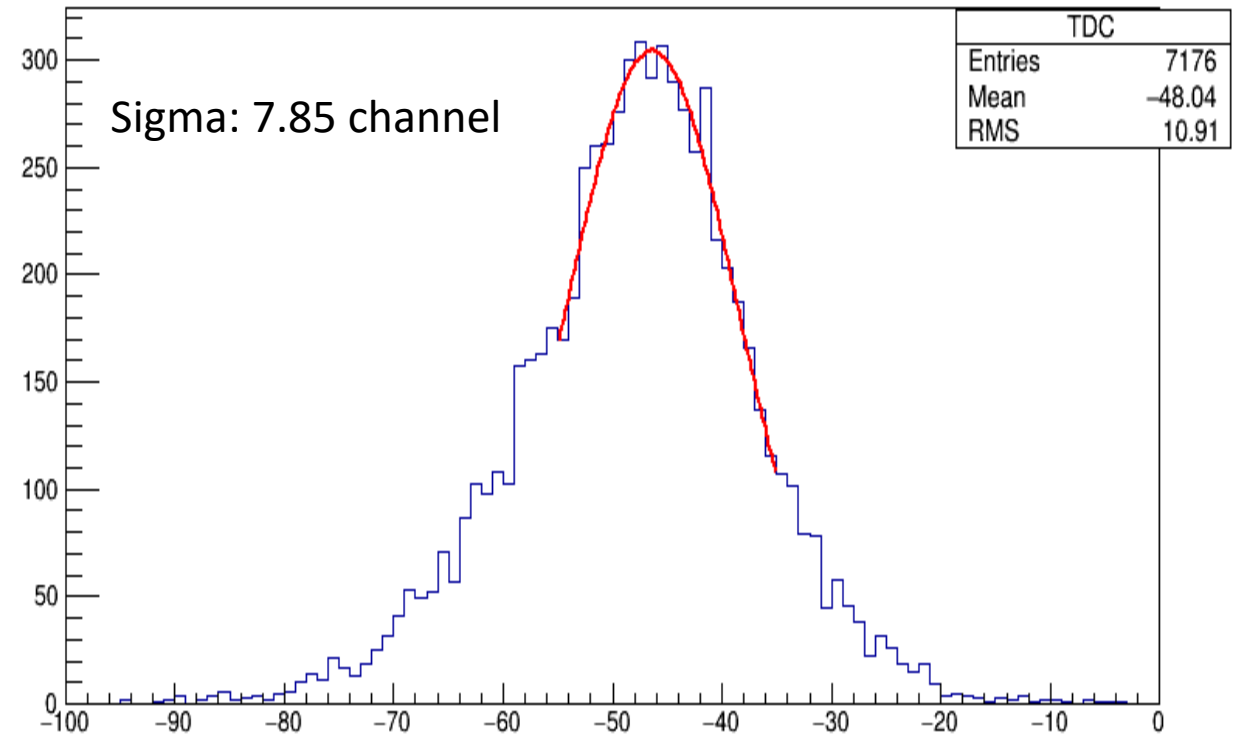
Right side PMT

Preliminary time resolution result(without time walk correction)

Total events



Add hit position cut
(based on scintillator time difference)



Preliminary time resolution result **205ps**= $7.85 \times 35\text{ps} \times \sqrt{\frac{2}{3}}$