Status of TOF Calibration in pre–ER & ER

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Measurement

TOF= {TVC[0]*Ct[0]+TVC[1]*Ct[1]–(s[0] + s[1])}/2

– T0[BBC] – T0 – T0[global] – T0[TVC]

Y = v/2*(TVC[0]*Ct[0]– TVC[1]*Ct[1]) + Y0

QVC[i] = QVC3[i] – QVC1[i]

ELOSS = Cq*sqrt(QVC[0]*QVC[1])

i = 0 : lower / 1 : upper

dTofRaw

TVC[i]

QVC[i]

How to get Calibration Parameters

A3,A4

mTofCalib.C <--- WA98 pass.cmz

pass0: TVC time calibration (*by Bench test*) --> Ct[i] constant

pass1: QVC gain calibration <-- QVC[i]

Min.Ion Particle ~ 3MeV (scint. 1.5 cm) --> Cq slat by slat

pass2: Slewing correction with BBC

<-- TVC[i], T0[BBC] from BBC

TOF = (TVC[0]*Ct[0] + TVC[1]*Ct[1])/2 – T0[BBC]

s[i] = a[i] + b[i]/sqrt(QVC[i])

TOF = TOF – (s[0] + s[1])/2 --> s[i] slat by slat

pass3: Time offset calibration with CGL

<-- TVC[i], Flight path length from CGL

TOFπ = L/cβπ

T0 = TOF – TOFπ

T0[global] = TOF – TOFπ –T0

T0[TVC] = TOF – TOFπ – T0 – T0[global]

--> T0, T0[TVC] slat by slat

--> T0[global] run by run

pass4: Ypos calibration with CGL

<-- TVC[i], position by CGL

Y0 = v/2*(TVC[0]*Ct[0]– TVC[1]*Ct[1]) – Y[CGL]

--> Y0 slat by slat

A6

dTofCal

dTofReconstructed

TOF

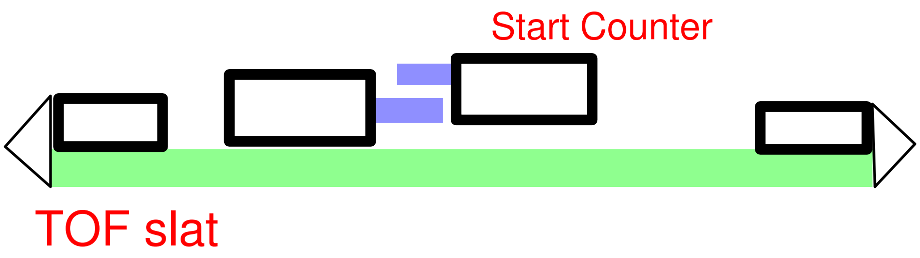
XTOF

ELOSS

Based on WA98 calibration program (pass.cmz, Fortran), design is completed.

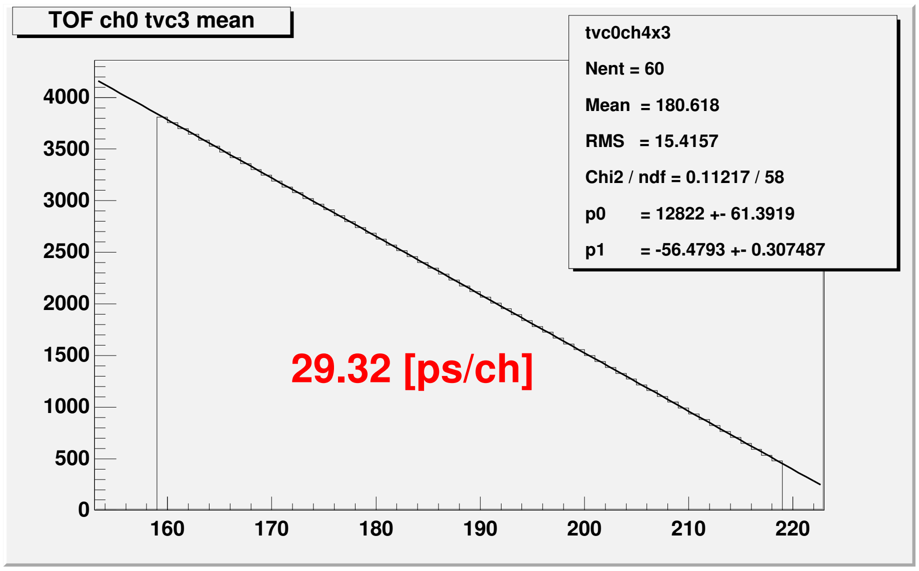
pre–ER in April 1999

using cosmic ray.

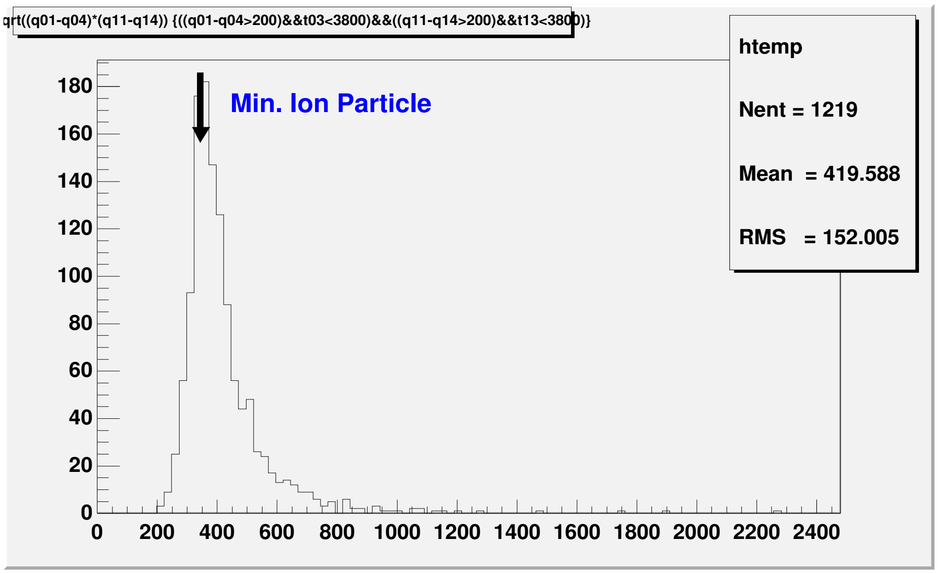


Calibration

o TVC time calibration (channel by channel in FEE)



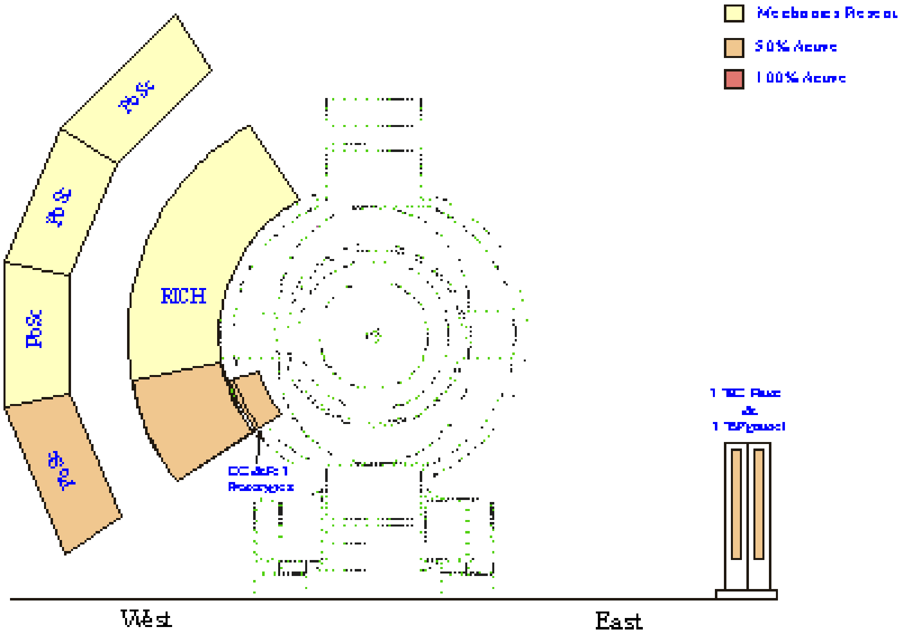
o QVC gain



o Slewing correction is underway.

What do you intend to do in the ER?

In ER, TOF 1 panel is installed in downstream of TEC.
We use 24 slats (48 PMTs)



Store the raw data for study of calibration.
We will do calibration process.

What do you need?

We will do gain calibration, slewing correction, Time offset and position calibration.

Check Timing performance of TOF.

We will use some info. from other detector
- o T0 from BBC
- o Track Association (straight line)
  Vertex from BBC and Tracking from TEC

What offline software is needed ?

pass0: TVC time calibration (Time conversion parameter)

pass1: QVC gain calibration

pass2: Slewing correction with BBC

pass3: Time offset calibration with Tracking

pass4: Ypos calibration with Tracking

Do you handle dead channel maps?
Dead channel is checked by QVC value.

What of it is written already?
pass 0 (Time conversion parameter) and
pass 1 (QVC gain calibration) is written in ROOT macro,
but not in new framework.

pass 2 (Slewing correction) is underway.

Who is doing the work?
- Akio Kiyomichi   Offline / coordinate & check
- Kunio Koseki   Online
- Miwako Suzuki

What is the status of your online monitoring ?
Developing is under way.

Plan
TOF 10 panels will be installed in East–arm
in July 15~31.
Owr working is shift to Hardware until installation.