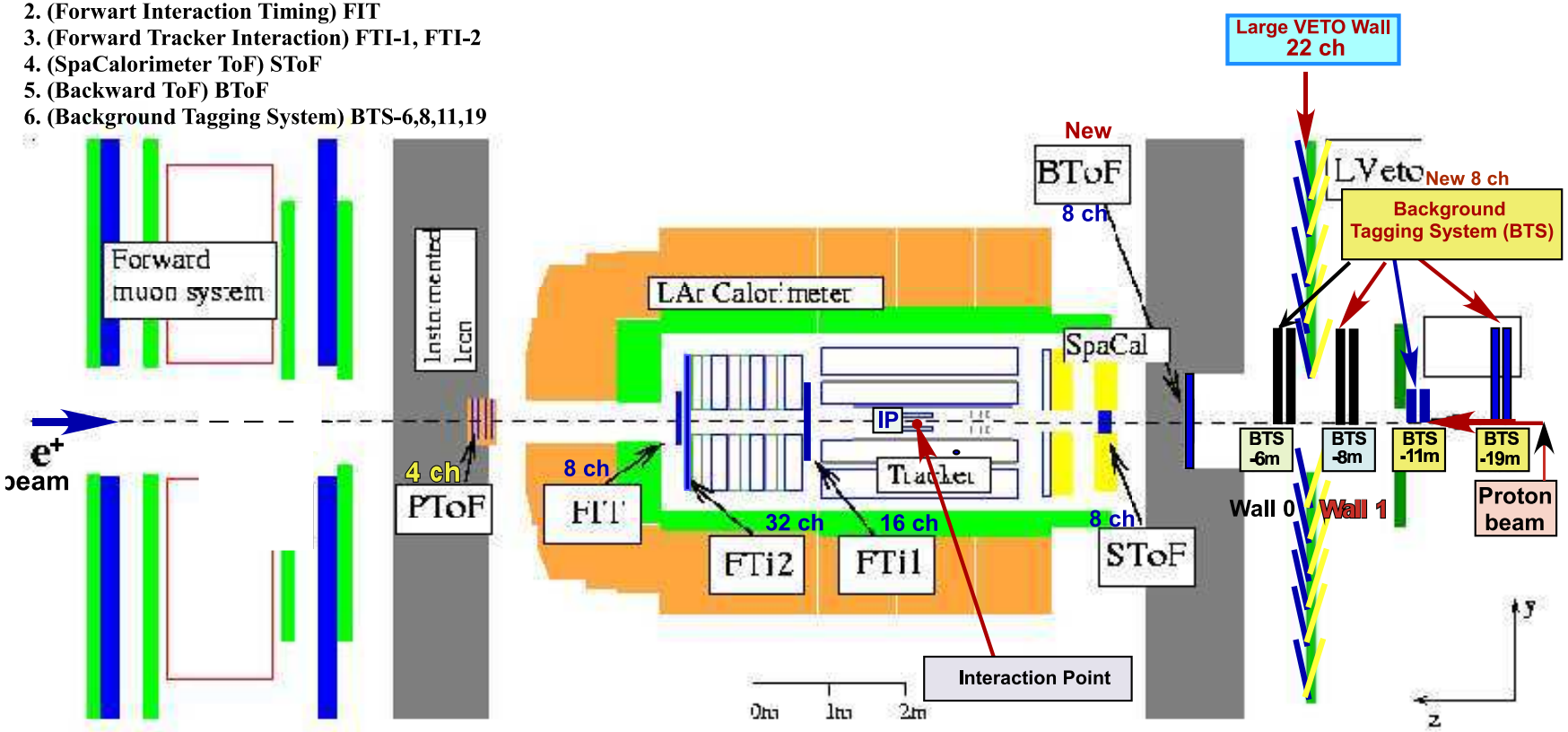
Status of TOF/VETO/BTS/FTI

A.Bunyatyan, 15.09.2004

ToF SubSys Names:

1. (PLUG) PToF
2. (Forwart Interaction Timing) FIT
3. (Forward Tracker Interaction) FTI-1, FTI-2
4. (SpaCalorimeter ToF) SToF
5. (Backward ToF) BToF
6. (Background Tagging System) BTS-6,8,11,19

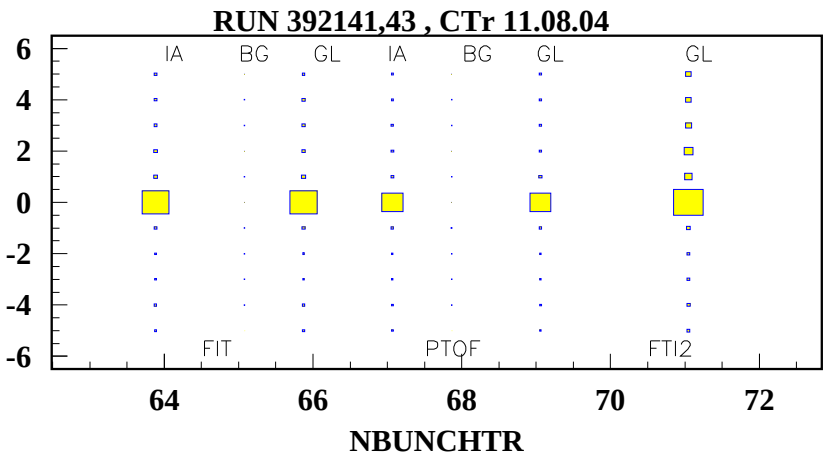


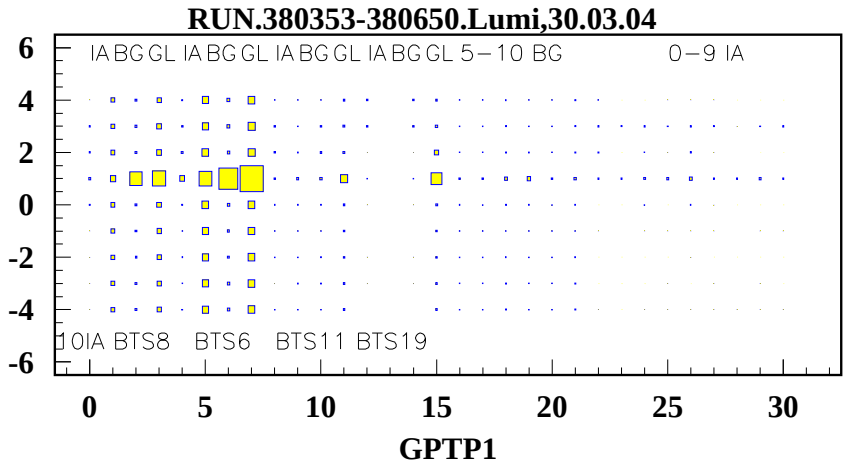
Purposes- rejection of background events at L1 level and monitor the background rates

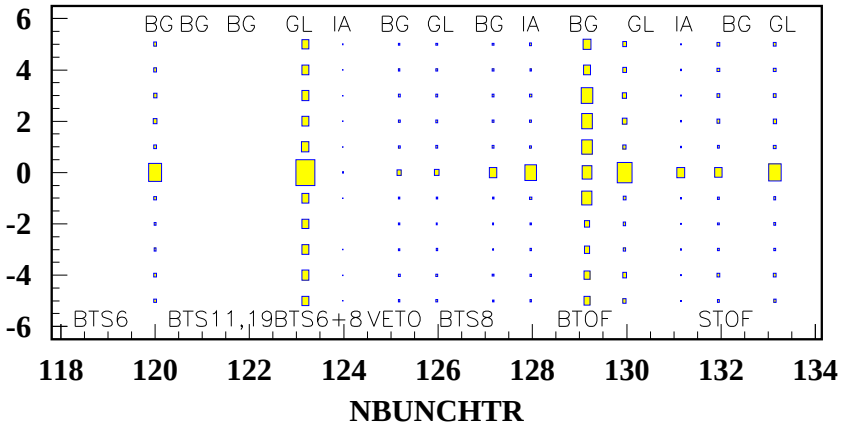
PTOF	5.3m	4 channels
FIT	2.7m	8 channels
FTi2	2.5m	32 channels
STOF	-2.5m	8 channels
BTOF	-3.3m	4 channels

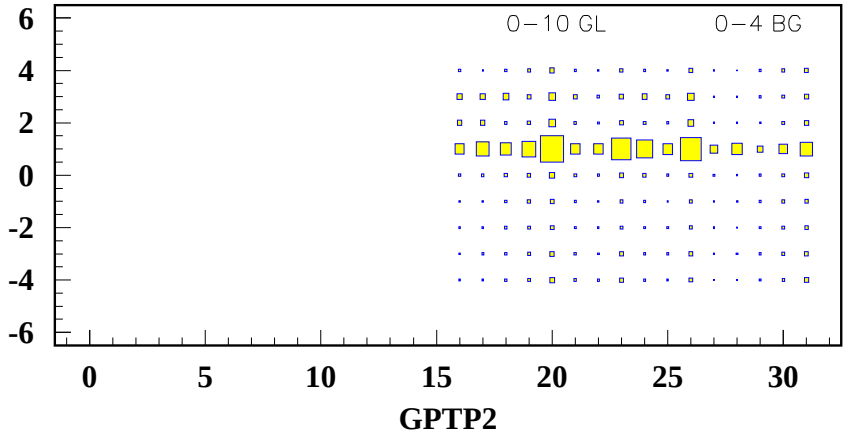
LVETO	-6.5m	22 channels
BTS	-6m	2 channels
BTS	-8m	2 channels
BTS	-11m	2 channels
BTS	-19m	2 channels

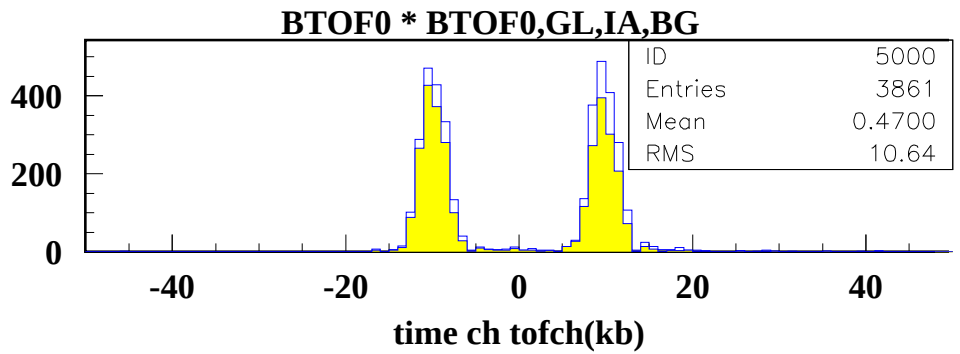
The system is operational and reliable. No big problem during the last months.

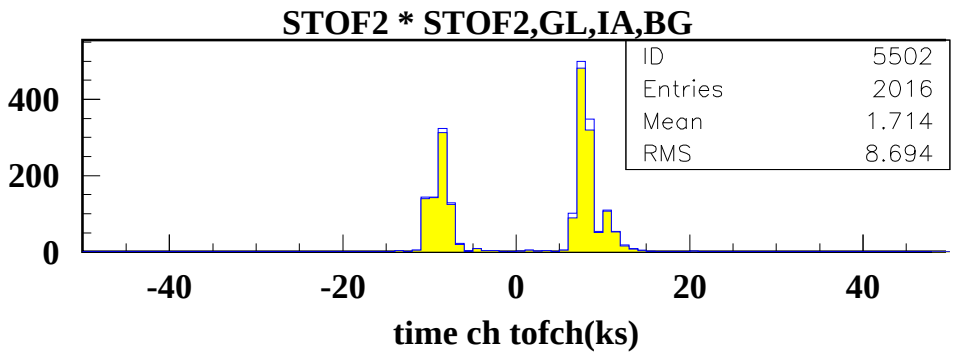


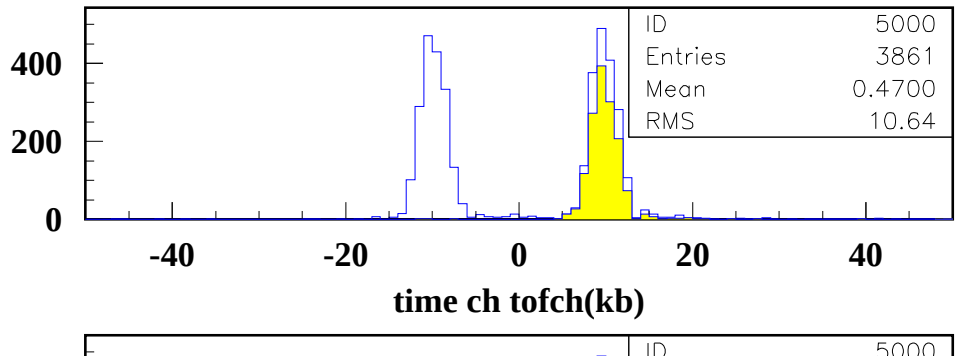


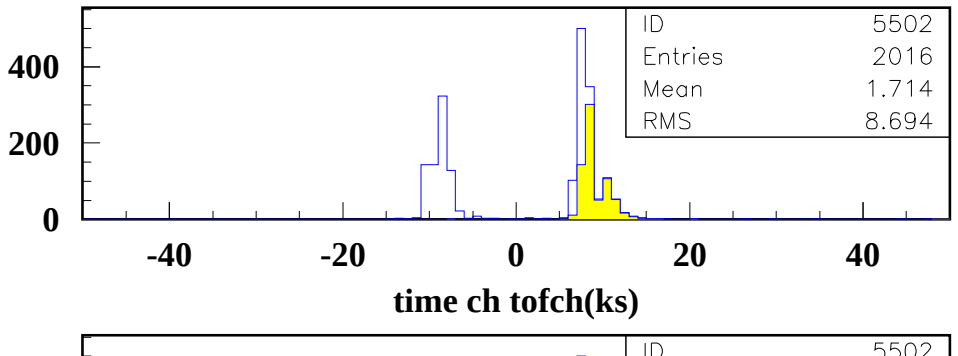


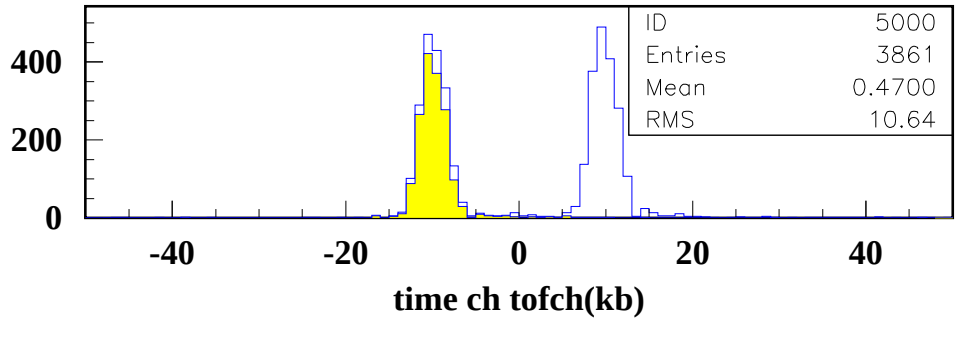


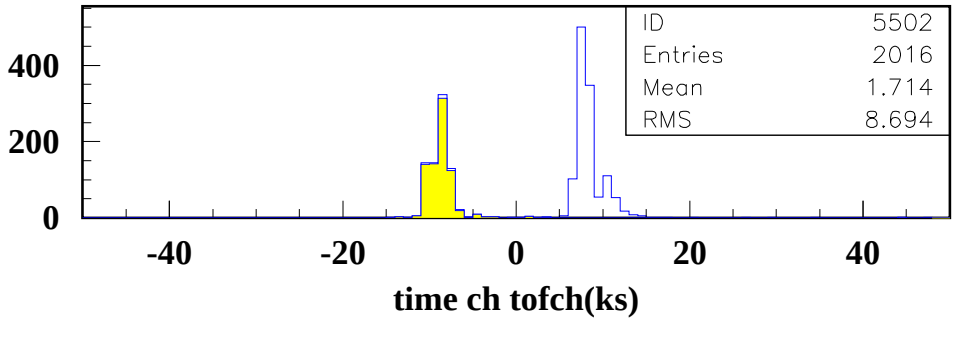

BTOF0 * BTOF0,GL,IA,BG
ID 5000
Entries 3861
Mean 0.4700
RMS 10.64
400
200
0
-40
-20
0
20
40
time ch tofch(kb)

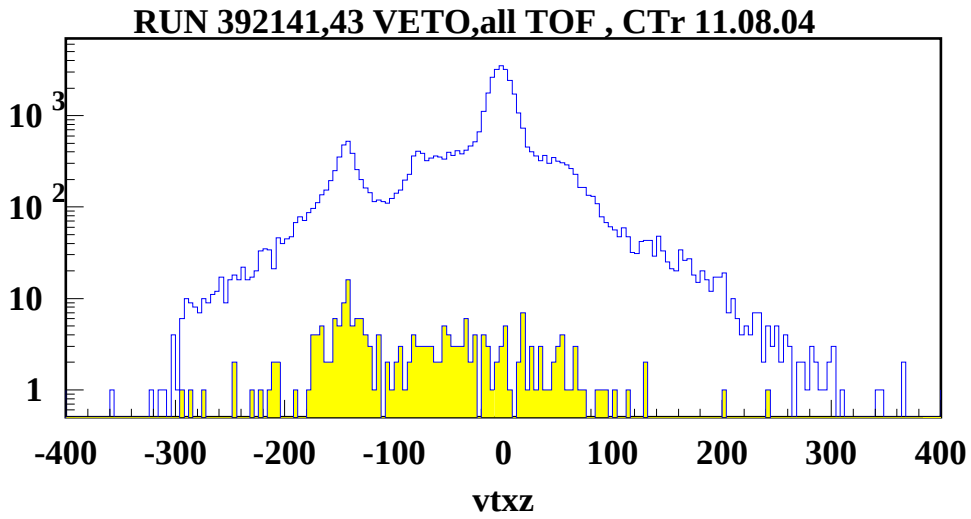

STOF2 * STOF2,GL,IA,BG
ID 5502
Entries 2016
Mean 1.714
RMS 8.694
400
200
0
-40
-20
0
20
40
time ch tofch(ks)

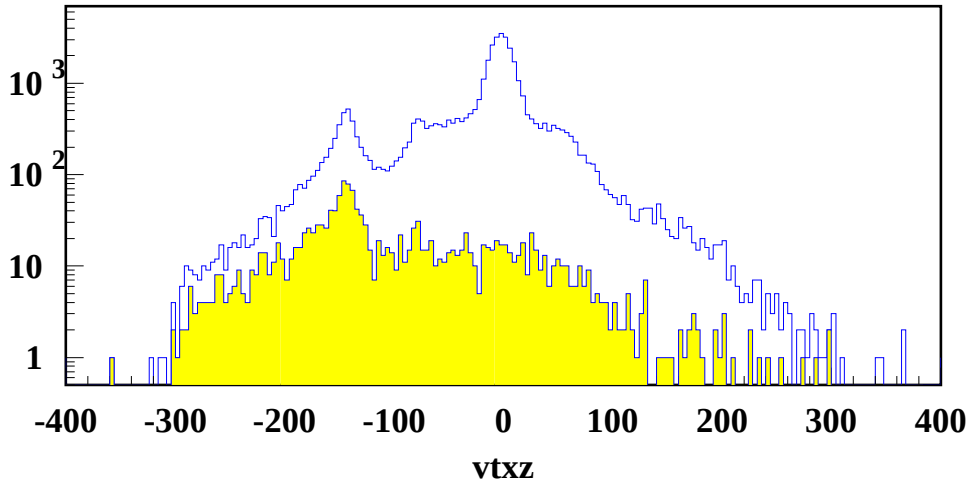

ID 5000
Entries 3861
Mean 0.4700
RMS 10.64
400
200
0
-40
-20
0
20
40
time ch tofch(kb)

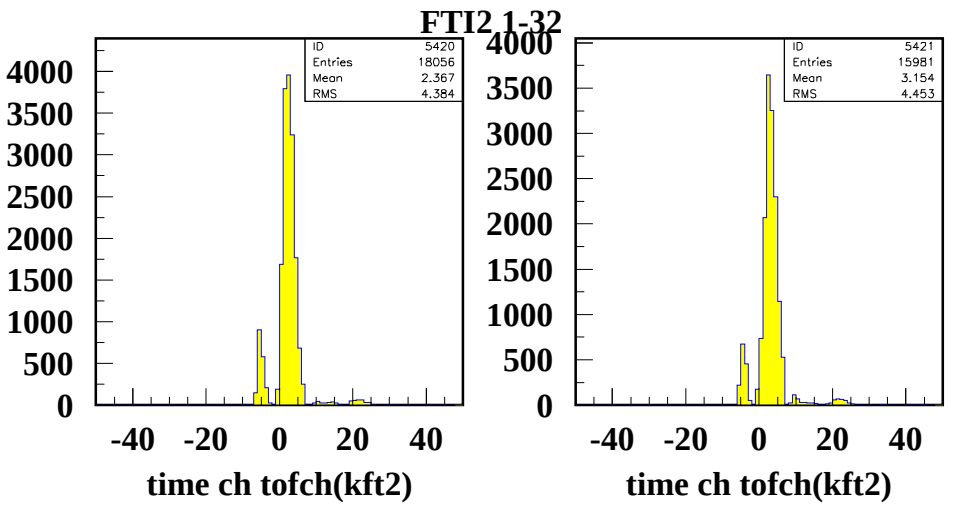

ID 5502
Entries 2016
Mean 1.714
RMS 8.694
400
200
0
-40
-20
0
20
40
time ch tofch(ks)

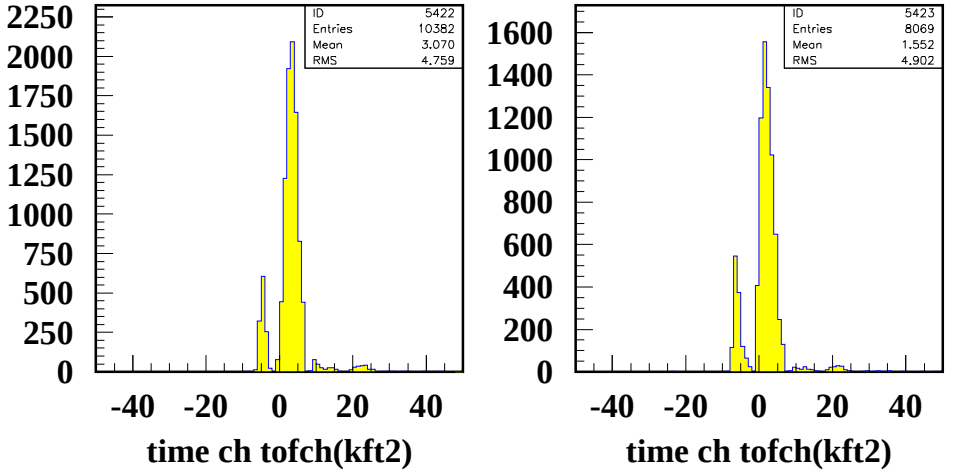

ID 5000
Entries 3861
Mean 0.4700
RMS 10.64
400
200
0
-40
-20
0
20
40
time ch tofch(kb)


ID 5502
Entries 2016
Mean 1.714
RMS 8.694
400
200
0
-40
-20
0
20
40
time ch tofch(ks)


RUN 392141,43 VETO,all TOF , CTr 11.08.04
10 3
10 2
10
1
-400 -300 -200 -100 0 100 200 300 400
vtxz


10 3
10 2
10
1
-400 -300 -200 -100 0 100 200 300 400
vtxz


FTI2 1-32
ID 5420
Entries 18056
Mean 2.367
RMS 4.384
ID 5421
Entries 15981
Mean 3.154
RMS 4.453
4000
3500
3000
2500
2000
1500
1000
500
0
-40 -20 0 20 40
time ch tofch(kft2)
time ch tofch(kft2)

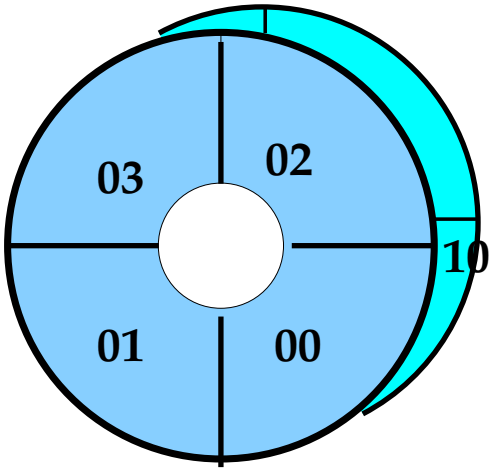

ID 5422
Entries 10382
Mean 3.070
RMS 4.759
ID 5423
Entries 8069
Mean 1.552
RMS 4.902
2250
2000
1750
1500
1250
1000
750
500
250
0
1600
1400
1200
1000
800
600
400
200
0
-40 -20 0 20 40
time ch tofch(kft2)
time ch tofch(kft2)

Efficiencies for BTOF and STOF channels

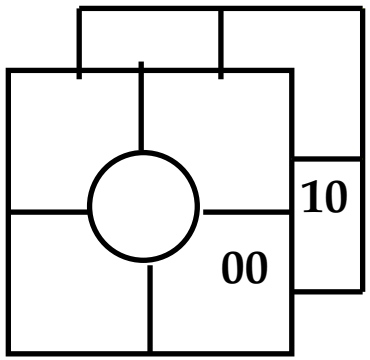
BTOF and STOF have similar segmentation (4 quadrants).

Efficiency is calculated as a ratio of 4 coincidences to 3 coincidences, e.g.

$$\epsilon_{BTOF\ 00} = \frac{N_{BTOF\ 00\&BTOF\ 01\&STOF\ 00\&STOF\ 01}}{N_{BTOF\ 01\&STOF\ 00\&STOF\ 01}}$$



BTOF



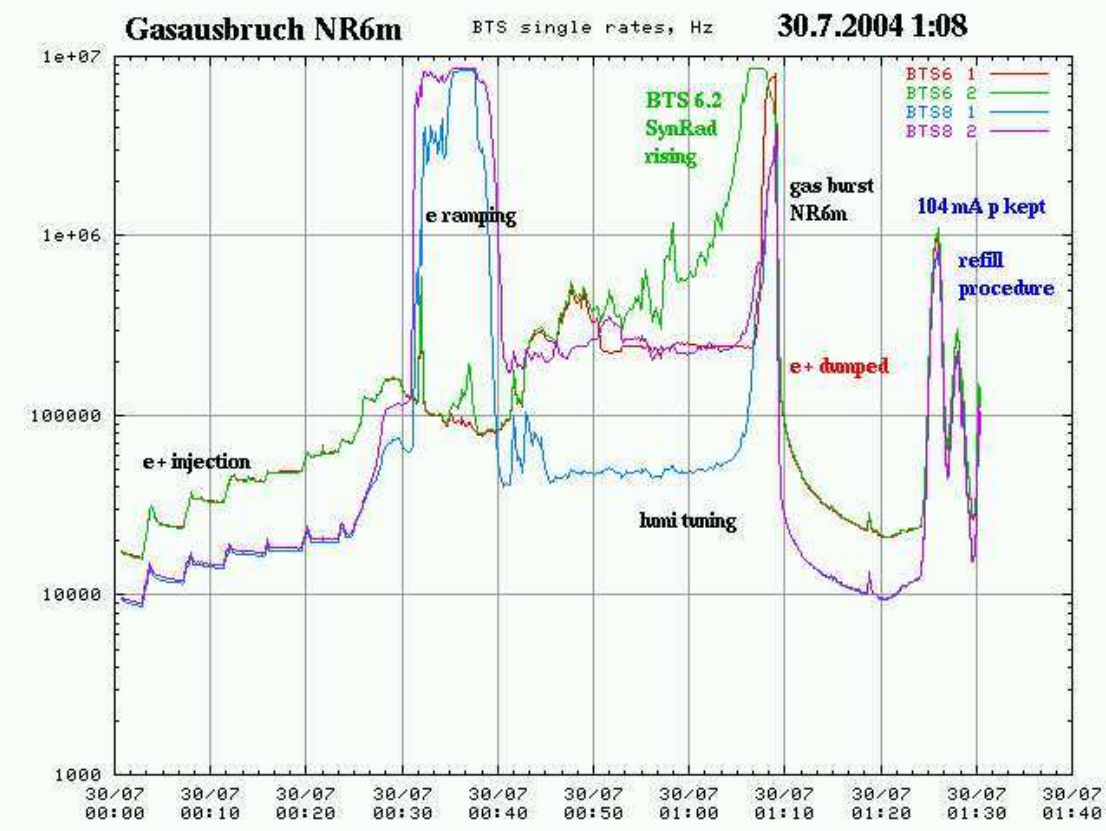
STOF

channel	BTOF	STOF
00	98%	82%
01	95%	21%
02	87%	91%
03	85%	76%
10	97%	74%
11	94%	90%
12	80%	77%
13	84%	84%

Other examples of usage TOF/VETO

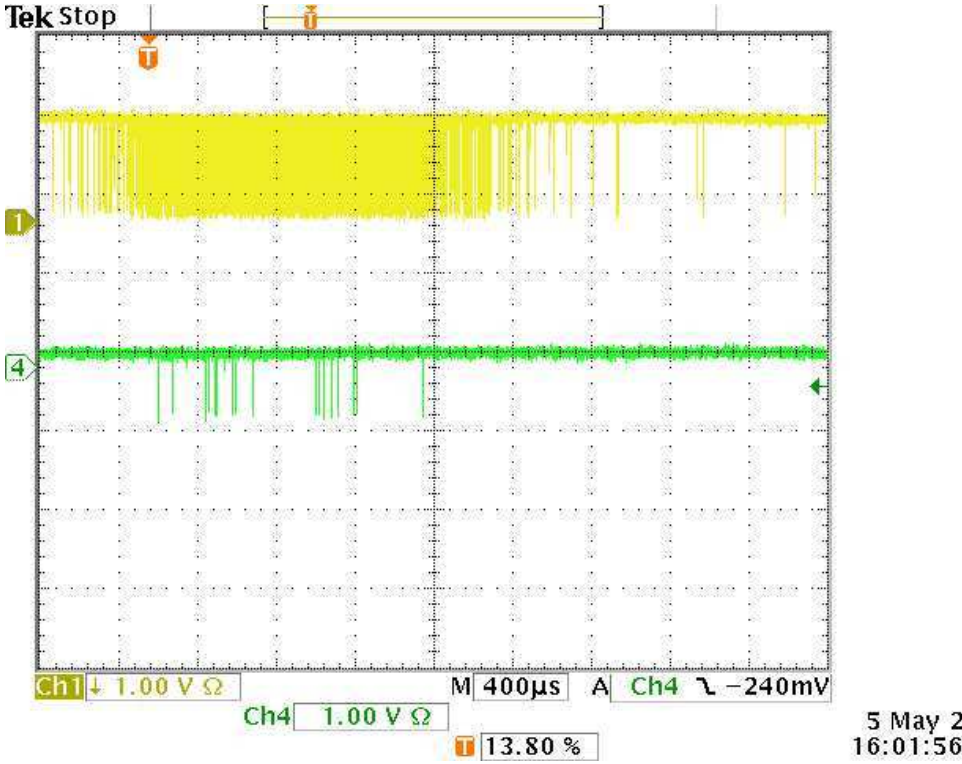
Gas outburst

BTS6-2 rate increased when e-beam was below 1.5cm)



Origin of Proton spikes

(BTOF-BG with $\sim$ 2 msec duration)



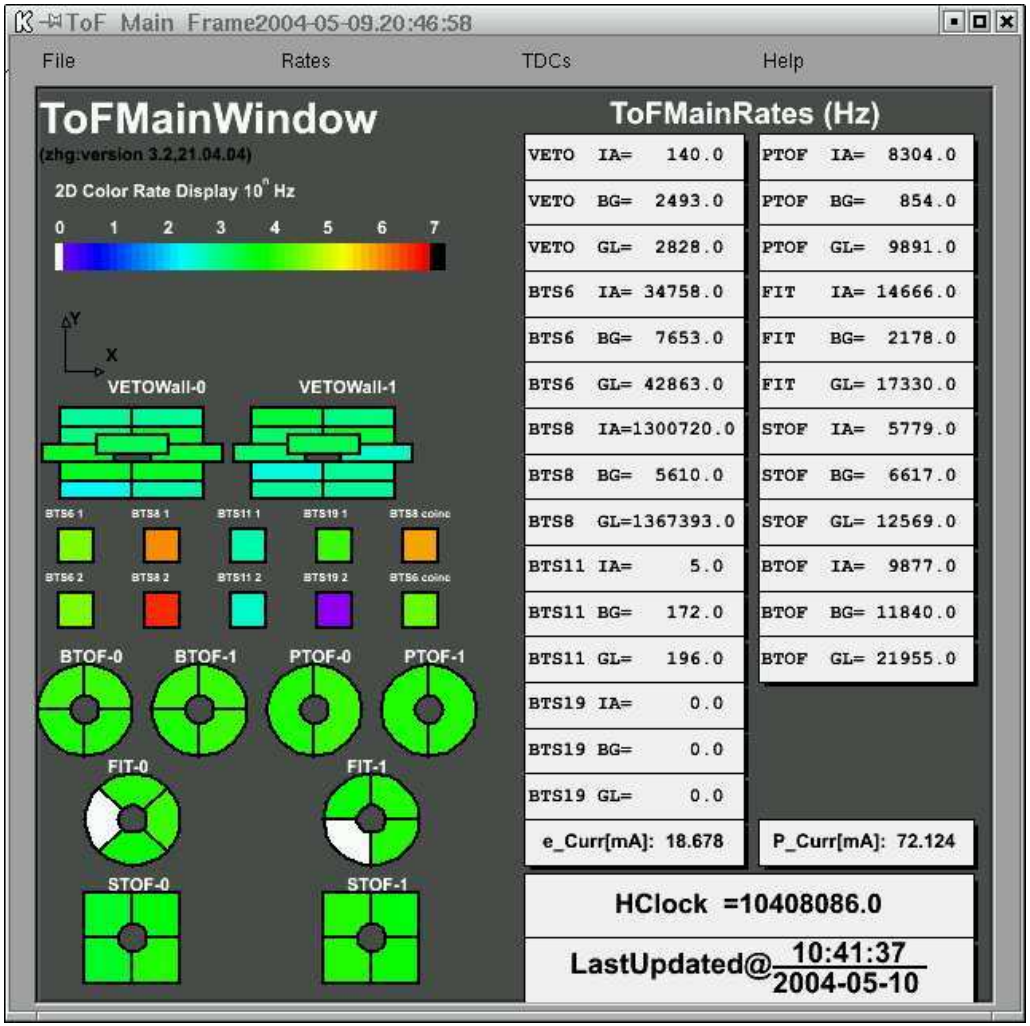
TOF readout

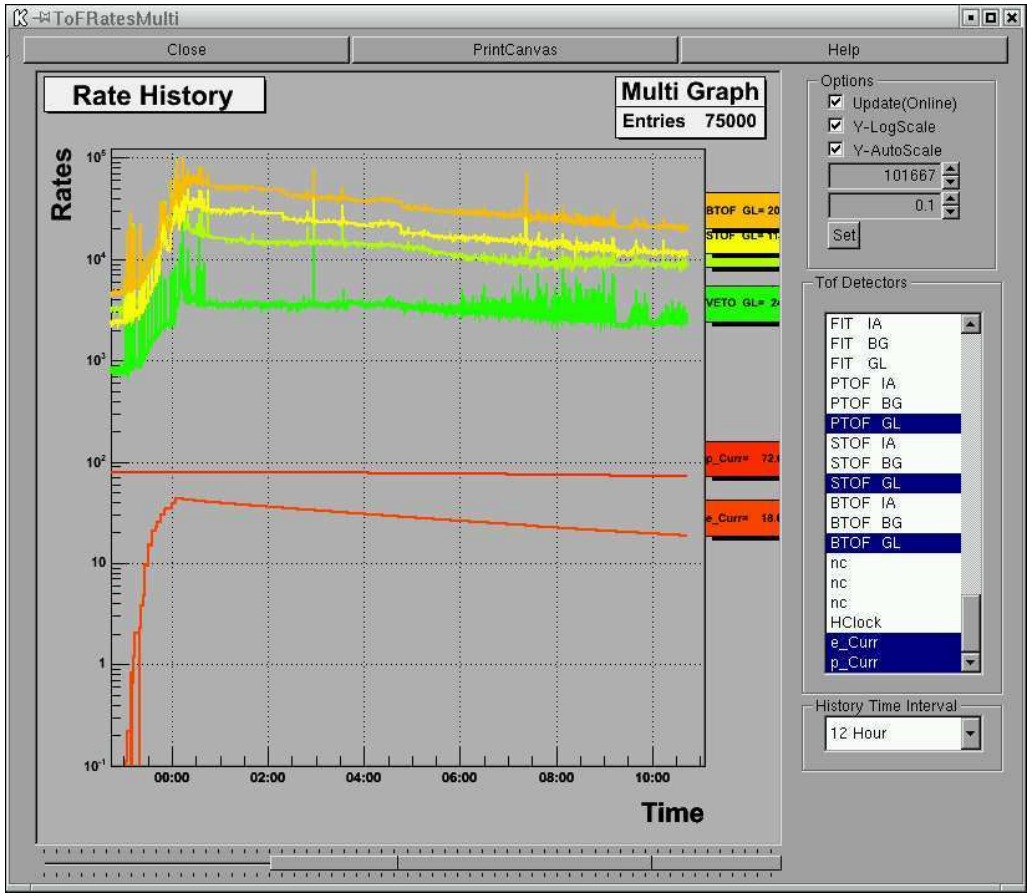
The new TOF monitoring program is routinely operated in H1 and HERA Control Rooms (H.Zohrabyan, V.Dodonov).

System monitors the rates, rate histories, TDC timing histograms for all individual channels and trigger elements. The stability of gates is monitored. Also the PTL2000 readout (gated coincidences for pairs of counters) is available.
The rate history is available in web (http://h1tofpc2.desy.de)

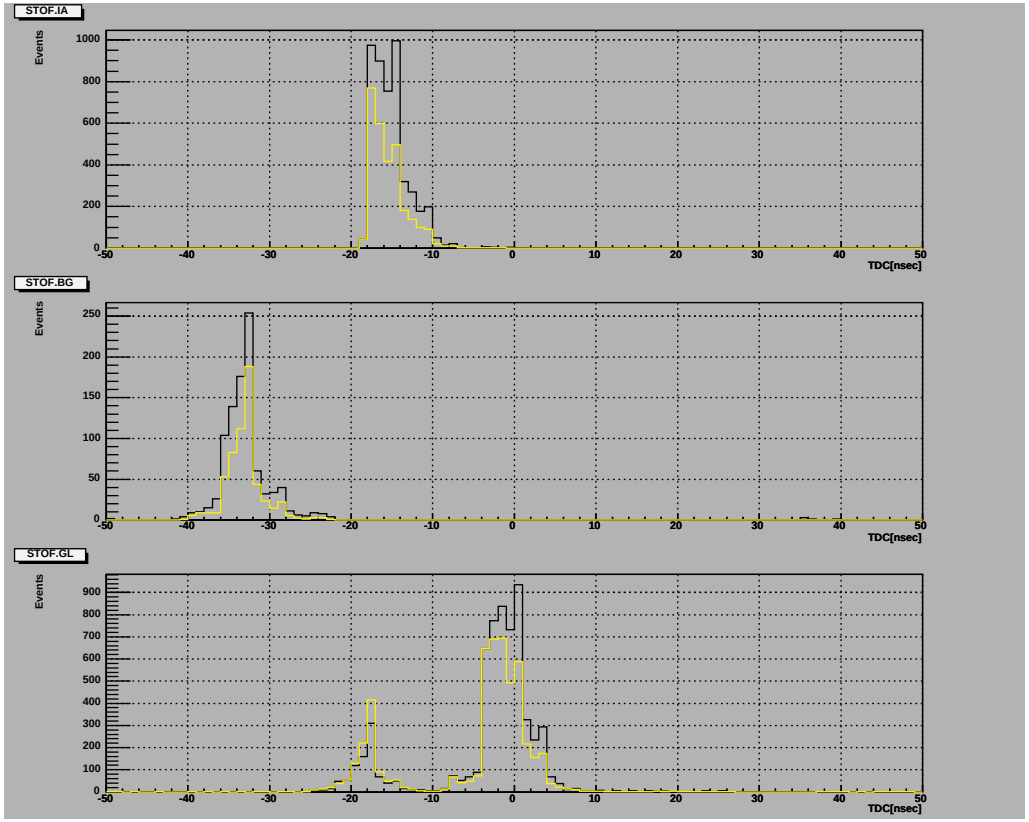
All TOF rates and rate histories are also available in luminosity java applets (I.Cheviakov).

Next step – send TOF data to H1 data stream via subsystem 101 or directly via the ethernet to a new CDAQ. Procedure and protocols to be worked out with experts.

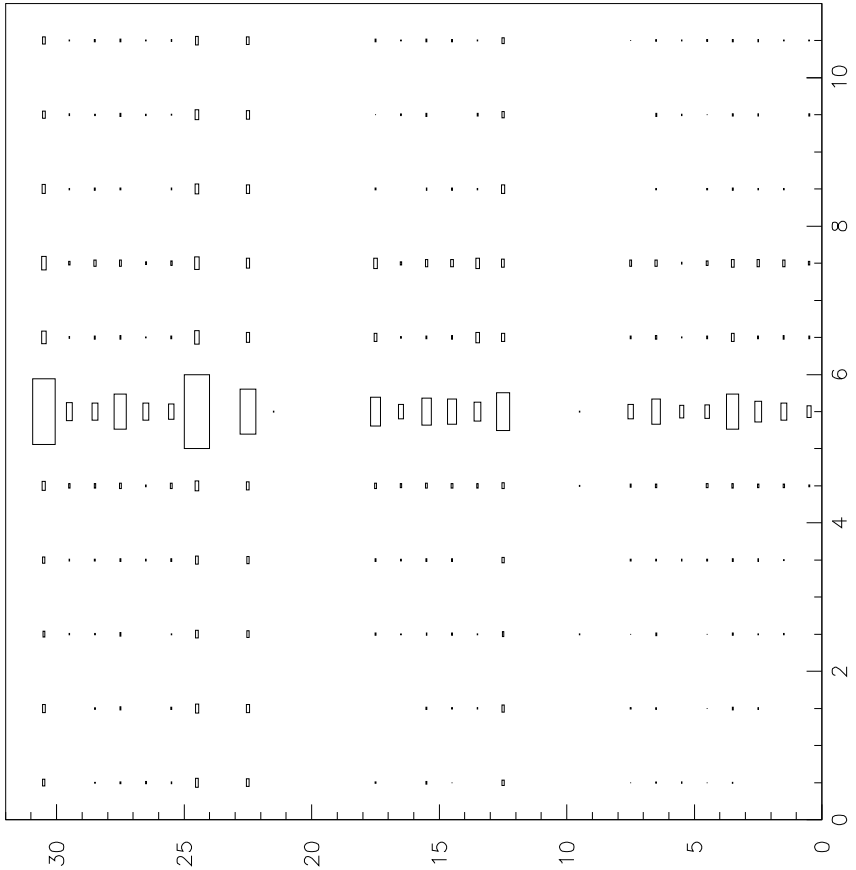

ToF Main Frame2004-05-09.20:46:58
File
Rates
TDCs
Help
ToFMainWindow
(zhg:version 3.2.21.04.04)
2D Color Rate Display 10^n Hz
0 1 2 3 4 5 6 7
Y
X
VETOWall-0
VETOWall-1
BTS6 1
BTS8 1
BTS11 1
BTS19 1
BTS8 coinc
BTS6 2
BTS8 2
BTS11 2
BTS19 2
BTS6 coinc
BTOF-0
BTOF-1
PTOF-0
PTOF-1
FIT-0
FIT-1
STOF-0
STOF-1
ToFMainRates (Hz)
VETO IA= 140.0
VETO BG= 2493.0
VETO GL= 2828.0
BTS6 IA= 34758.0
BTS6 BG= 7653.0
BTS6 GL= 42863.0
BTS8 IA=1300720.0
BTS8 BG= 5610.0
BTS8 GL=1367393.0
BTS11 IA= 5.0
BTS11 BG= 172.0
BTS11 GL= 196.0
BTS19 IA= 0.0
BTS19 BG= 0.0
BTS19 GL= 0.0
e_Curr[mA]: 18.678
PTOF IA= 8304.0
PTOF BG= 854.0
PTOF GL= 9891.0
FIT IA= 14666.0
FIT BG= 2178.0
FIT GL= 17330.0
STOF IA= 5779.0
STOF BG= 6617.0
STOF GL= 12569.0
BTOF IA= 9877.0
BTOF BG= 11840.0
BTOF GL= 21955.0
P_Curr[mA]: 72.124
HClock =10408086.0
LastUpdated@10:41:37
2004-05-10


ToFRatesMulti
Close
PrintCanvas
Help
Rate History
Multi Graph
Entries 75000
Rates
Time
00:00
02:00
04:00
06:00
08:00
10:00
Options
Update(Online)
Y-LogScale
Y-AutoScale
101667
0.1
Set
Tof Detectors
FIT IA
FIT BG
FIT GL
PTOF IA
PTOF BG
PTOF GL
STOF IA
STOF BG
STOF GL
BTOF IA
BTOF BG
BTOF GL
nc
nc
nc
HClock
e_Curr
p_Curr
History Time Interval
12 Hour

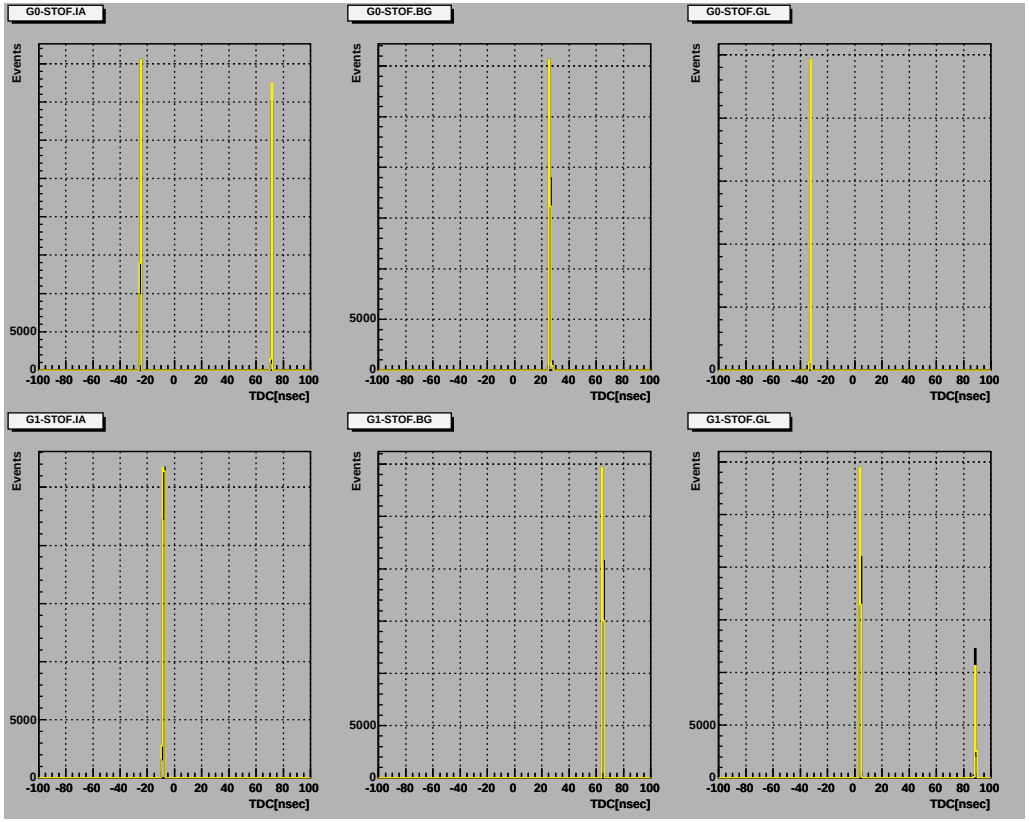
TDC timing for STOF IA, BG, GL

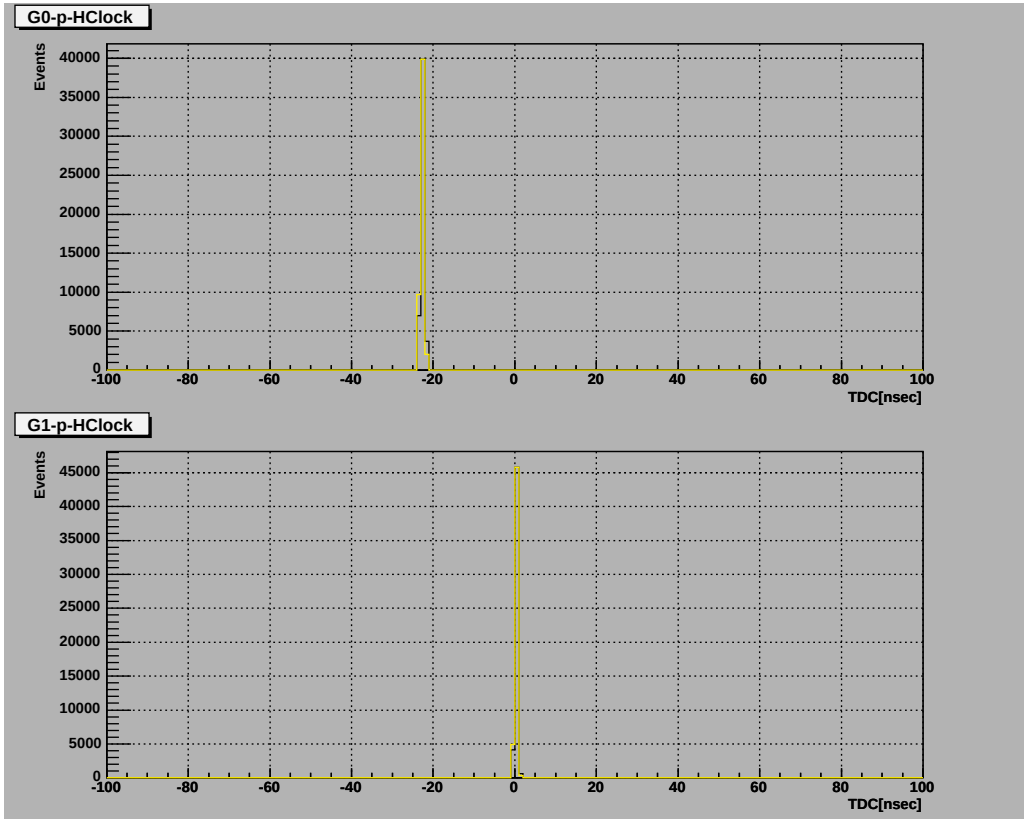


PTL2000 pipeline for VETO
(11 $\times$ IA, BG, GL)



Monitoring stability of gates and HERA clock





	PM	Time meas's	single rates	Trigger elements	Gates	Hits
TOF	4	4	4	3	3	2*3
T	8	8	8	3	3	8*3
TI2	32	32		1		
TI1	16	-				
TOF	8	8	8	3	3	2*3
TOF	8	8	8	3	3	4*3
ckup					2	
.clock					2	
ETO	22	22	22	3	3	11*3
TS	8	4	8	12	12	4*3
l		86	58	33	31	31*3
		TDC	*Scalers*	*TDC* *PTL2000*	*TDC*	*PTL2000*

Shutdown works: new BSToF detector

Will replace the $radiation\ monitor$ (S.Ghazaryan and A.Hovhannisyan)
One scintillator plane, d=2cm,8-fold ϕ segmentation, Spacal-type Hamamatsu PMs.
The readout and HV will be integrated into the TOF readout system:
– 'OR' of all channels will be fed to the same place as old rad.monitor
– For each channel the rate and timing histograms will be shown in the TOF monitor

BSToF is installed and tested