Period coordinator report

Week 54, October 29th – November 05th

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COMPASS Friday meetimg 05/11/2004

COMPASS Hadrons Setup 29/10/2004 – 30/10/2004:

1. **Data taking with Pure hadrons at -190 GeV (file: <239>M2.52)**
2. **Trigger accepted in DAQ:**
   - **Primakoff 1 = BT & PK & ECAL2 (low threshold) & Veto Primm.1**
   - **Primakoff 2 = BT & ECAL2 (high threshold) & Veto Primm.1**
   - **Calorimeter trigger ~ HCAL2**
   - **Beam trigger ~ S1 & S2**
   - **Charge Exchange = ECAL2 low & Beam trigger & no signal from multiplicity counter & Veto Primmakoff_1**

   - **Veto Primmakoff 1 = (Inner Veto & Sandwich-1 & Beam killer 3)**
   - **ECAL2 (low threshold) ~ 40-50 ADC ch.**
   - **ECAL2 (high threshold) ~ 50GeV**

What was before W45 (28/10/2004) :

Beam setup:Pure at -190 GeV (file: <239>M2.52)
T6 target head:(3) Be 100mm length
Current at T6 head: 1.19005e+13 p/spill
Hadron ion chamber: 3.06316e+08
Muon ion chamber: 5.9274e+06
SM1 current:-2500 A SM2 current:-5006 A

11632, 28/10/2004 ,17:10 Hannappel*Trigger* Rates Without HCAL1 in Veto:

1 Beam Trigger 4252643
2 Hadron Veto 4840263
3 Beam Killer 3649026
4 Primakoff Hodo 763630
5 ECAL low 330076
6 ECAL high 73596
7 Primakoff 1 152025
8 Primakoff 2 53456

With HCAL1 in Veto, HCAL1 thresholds are the normal for the muon setup, i.e. 5 GEV

1 Beam Trigger 4227045
2 Hadron Veto 5083786
3 Beam Killer 3610226
4 Primakoff Hodo 755463
5 ECAL low 327977
6 ECAL high 73538
7 Primakoff 1 119776 (- 21%)
8 Primakoff 2 43515 (-17%)

COMPASS Hadron Setup: 29/10/2004 – 30/10/2004:

1. Beam conditions:

- Pure at -190 GeV (file: <239>M2.52)
- T6 target head:(4) Be 40mm length
- Current at T6 head: 1.1834e+13 p/spill
- Hadrons ion chamber: 1.43168e+08
- Muon ion chamber: 2.7898e+06
- SM1 current:-2500 A SM2 current:-5007 A

2. Trigger rate:

- 1 Prim1 56874 56871
- 1 Prim2 23728 23727
- 3000 Calorimeter 272160 91
- 10000 Beam 1984660 1 99
- 1 Charge Exchange 4079 4042

COMPASS Hadron Setup 30/10/2004 – 31/10/2004:

1. Beam :

- Pure at -190 GeV (file: <239>M2.52)
- T6 target head:(4) Be 40mm length
- Current at T6 head: 1.1834e+13 p/spill
- Hadron ion chamber: 1.43168e+08
- Muon ion chamber: 2.7898e+06
- SM1 current:-2500 A SM2 current:-5007 A

2. Trigger rate:

HCAL2 threshold set to 18GeV (9 MIPS), included in Primakoff 1 trigger:

	with	without	
1 Prim1 33977	56870 ->	33975	-40%
1 Prim2 22462	23720 ->	22454	-10%
1 Charge Exchange 4112	4042 ->	4104	+9.5%

COMPASS Hadron Setup 31/10/2004 10:33 (SF06 removing):

1. **Beam:**
   - T6 target head:(4) Be 40mm length
   - Current at T6 head: 1.10464e+13 p/spill
   - Hadron ion chamber: 2.42261e+08
   - Muon ion chamber: 3.3744e+06
   - SM1 current:-2499.8 A SM2 current:-5006 A
   - Beam setup: Pure at -190 GeV (file: <239>M2.52)

2. **Trigger rate:**

	With SF06	and without SF06	in beam:
Prim1 43849	43849	37065	-15%
Prim2 28630	28617	25635	-10%
Charge Exchange	6148	5926	-3.6%

New primary protons beam beam setup.

- **01/11/2004 – Start data taking with new beam conditions**

(11721) 14:43 Lars Schmitt Change of primary beam intensity

After this morning's meeting and discussions with Lau Gatignon it was agreed that at the present rate taken by COMPASS it is not useful to have

1.2x10^13 primary protons to simply achieve

2x10^6 hadrons with thin production target and collimators all closed.

This produces a high radiation load on beam line equipment and on the other hand the experiment suffers from a very high radiation background.

(11722) 15:54 Lars Schmitt Beam resteering finished

The new value is 4.4x10^12 of primary protons on T6.

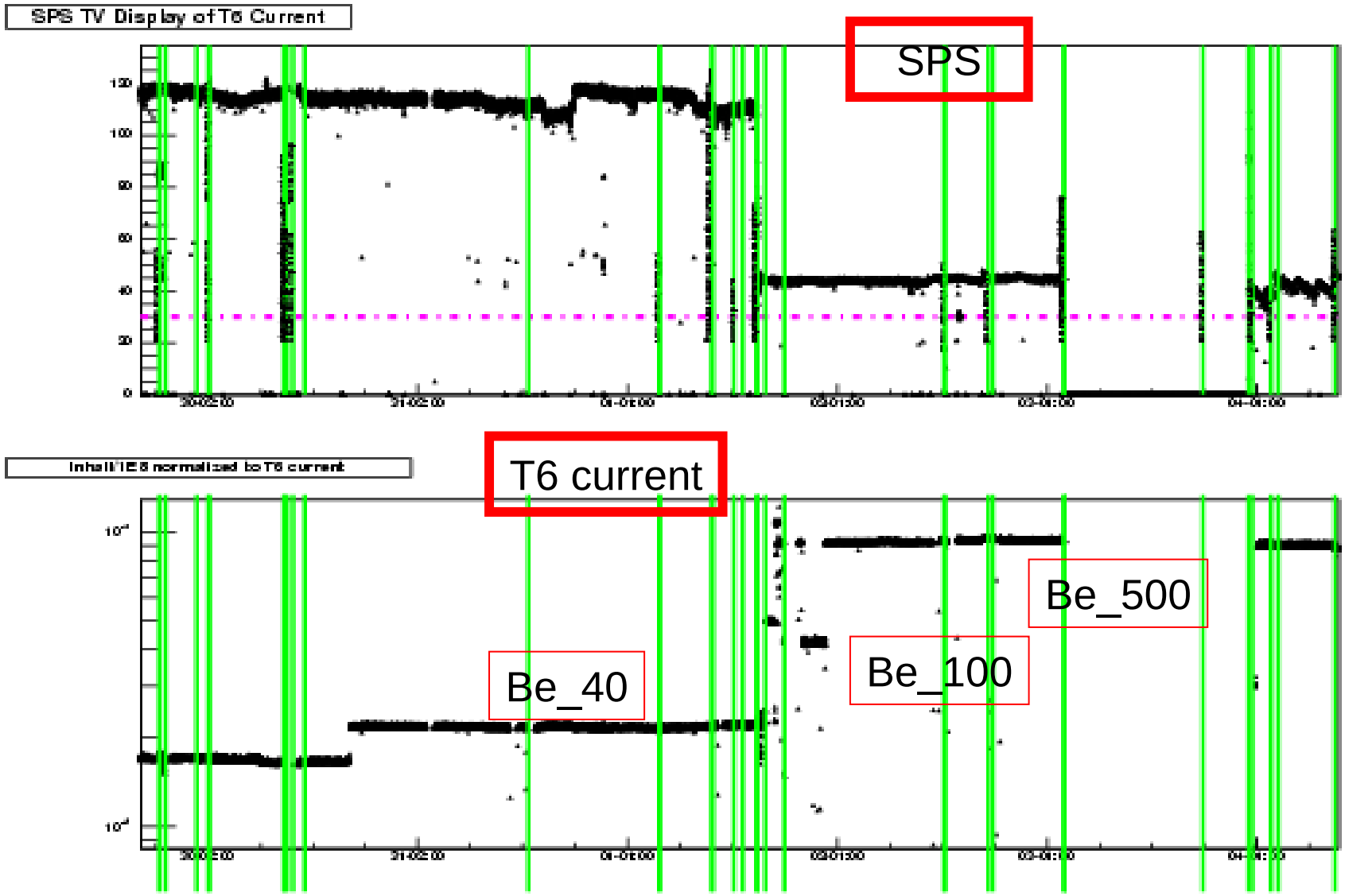
Resulting beam rates at COMPASS:

40mm head : 1.0x10^6
100mm head : 2.2x10^6
500mm head : 5.7x10^6

The results of beam resteering 01/11/2004 14:40:

1.Current at T6 head: 4.39387e+12 p/spill

2.Hadron ion chamber: 2.21482e+08



COMPASS Hadron Setup 01/11/2004 with new beam :

Before 01/11/2004 15:00

Beam setup:

- Hadrons -190 GeV (file: <239>M2.52)
- T6 target head:(4) Be 40mm
- Current at T6 head: 1.0923e+13
- Hadron ion chamber: 2.38717e+08
- Muon ion chamber: 3.3818e+06

Trigger setup:

Prim_1	37037
Prim_2	25748
Calo 3000	486
BT 10000	244
Ch_exch	5283

New beam parameters

Beam setup:

- Hadrons -190 GeV (file: <239>M2.52)
- T6 target head:(4) Be 40mm
- Current at T6 head: 4.3654e+12
- Hadron ion chamber: 2.13505e+08
- Muon ion chamber: 3.034e+06

Trigger setup:

Prim_1	30741
Prim_2	21556
Calo 3000	71
BT 10000	199
Ch_exch	4723

New beam, ScFi_07_04 removal 01/11/2004, 18:00-21:00

Beam setup:Pure at -190 GeV (file: <239>M2.52)
T6 target head:(3) **Be 100mm length**
Current at T6 head: **4.39387e+12 p/spill measured at 20:27:10**
Hadron ion chamber: **9.40466e+07 measured at 20:27:10**
Muon ion chamber: **2.553e+06 measured at 20:27:10**
SM1 current:-2500 A SM2 current:-4973 A

Triggers rate:	with ScFi_7_4	without ScFi_7_4	
▪ Prim_1	33867	26362	-22%
▪ Prim_2	23204	19937	-14%
▪ Ch_exch	4901	3372	-31%

Finally, after removal of all possible materials from beam-line we:

- continue data taking with beam 4.4e+12 p/spill

- alligment was done 02/11/2004

(11766 12:44 J. Hannappel*General* Starting Alignment)

Beam setup:Pure at -190 GeV (file: <239>M2.52)
T6 target head:(2) Be 500mm length 3mm width
Current at T6 head: 4.39387e+12 p/spill
Hadron ion chamber: 2.21482e+08
Muon ion chamber: 5.7868e+06
SM1 current:-2499.8 A SM2 current:-5002 A

- **11773 A.Korzenev check_trigger 3 mm target Pb**

1 Prim1 62156	**62154**
1 Prim2 40007	**39973**
3000 Calorimeter 399199	**134**
10000 Beam 4225520	**423**
1 ChargeExchange 8053	**8028**

- **Prim1/Beam=0.0147**
  Prim2/Beam=0.0094
  ChargeExchange/Beam=0.0019

11798 J. Pretz 03 November 2004, 17:00 target effect

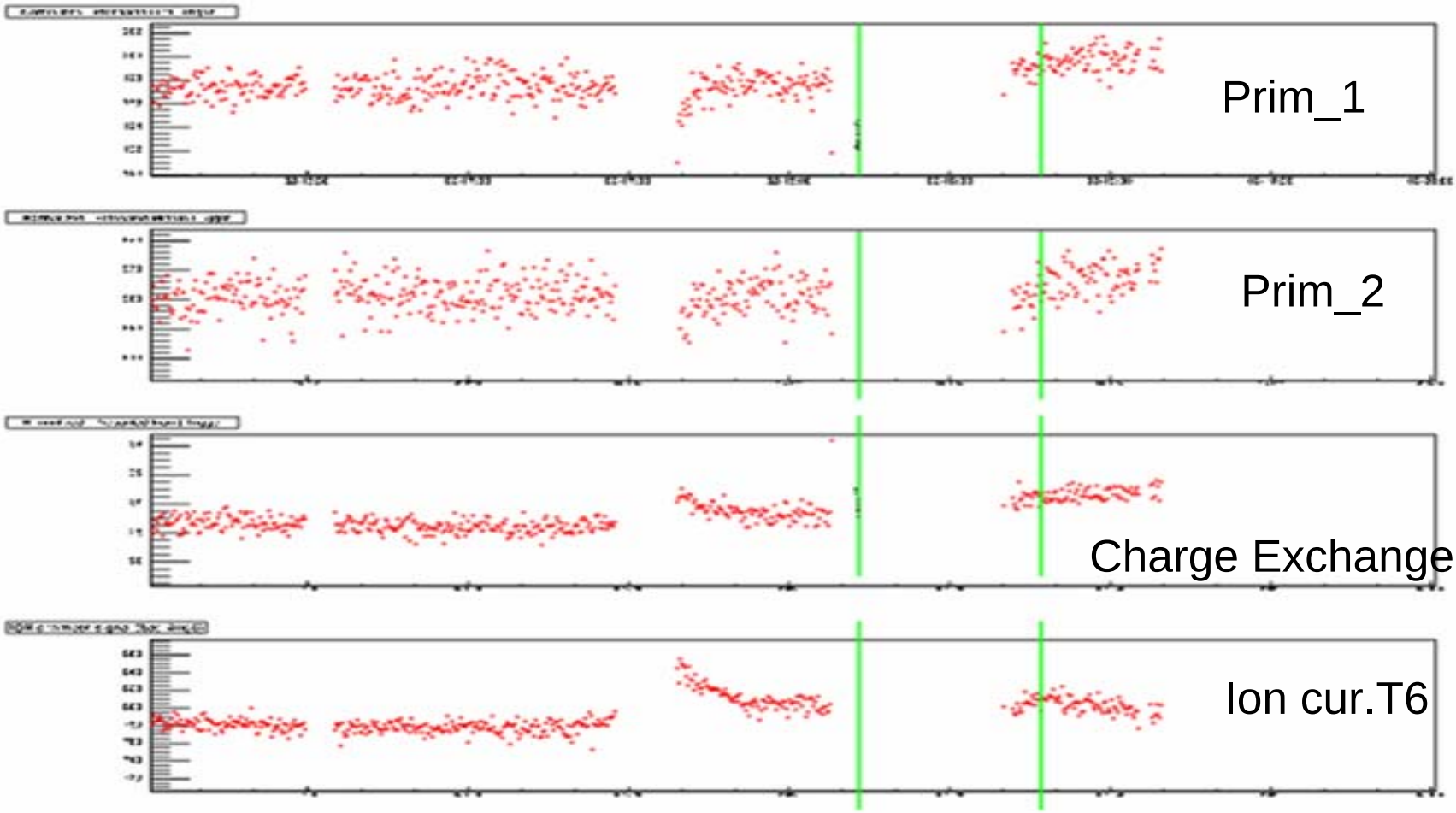
Looking at scalers we observe the floowing target effectsgoing from empty target to 1.6 mm target

Prim 1 1%

Prim 2 0.7%

Charge Ex 5%

No effect is seen going from 3mm to emty target head probably because beam postition changed as well

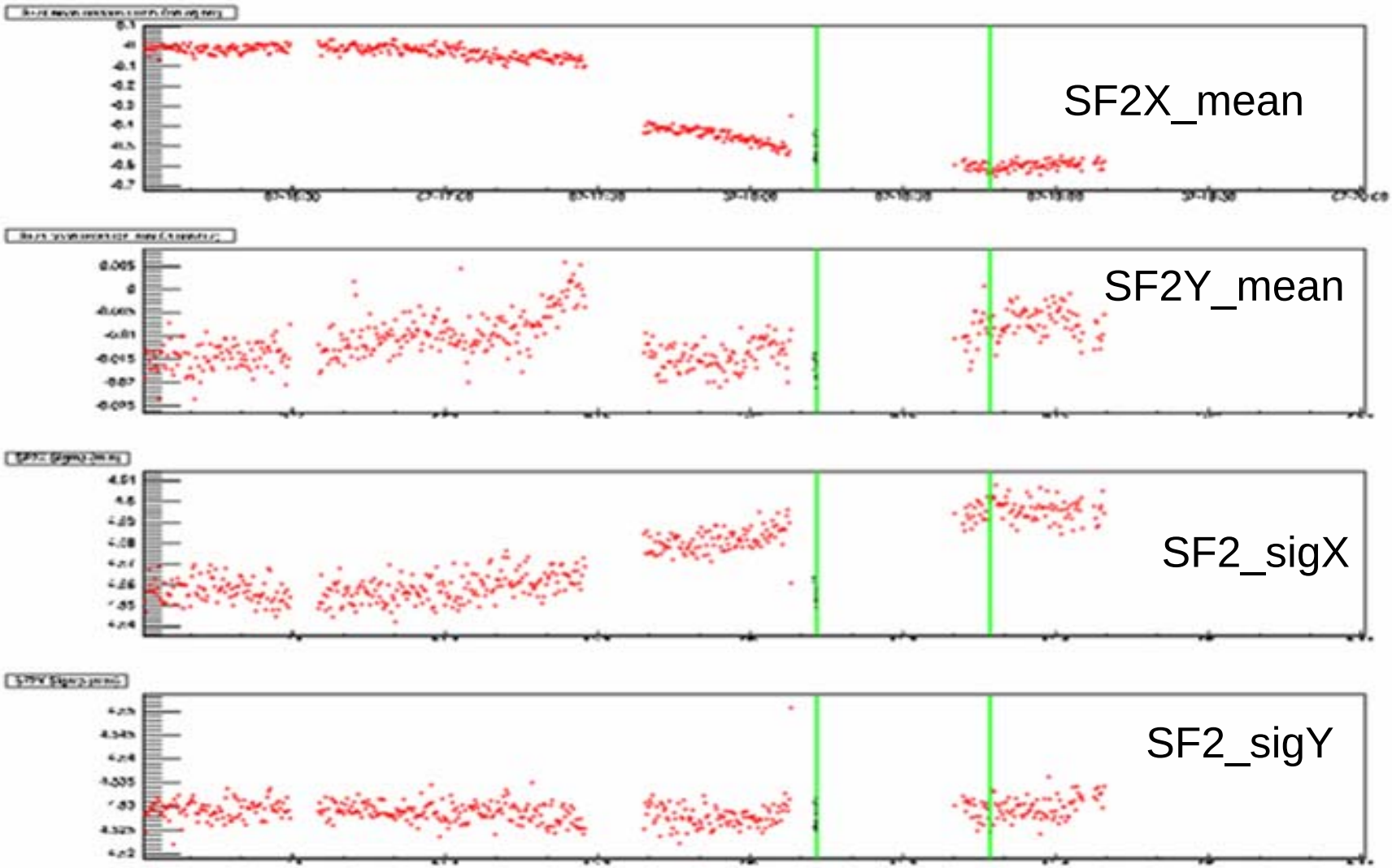


11798 J. Pretz 03 November 2004, 17:00 target effect

No effect is seen going from 3mm to emty target head probably because beam postition changed as well time of target changes

~ 2.11.2004 17.30 3mm -> 0mm

~ 2.11.2004 18.30 0mm -> 1.6 mm

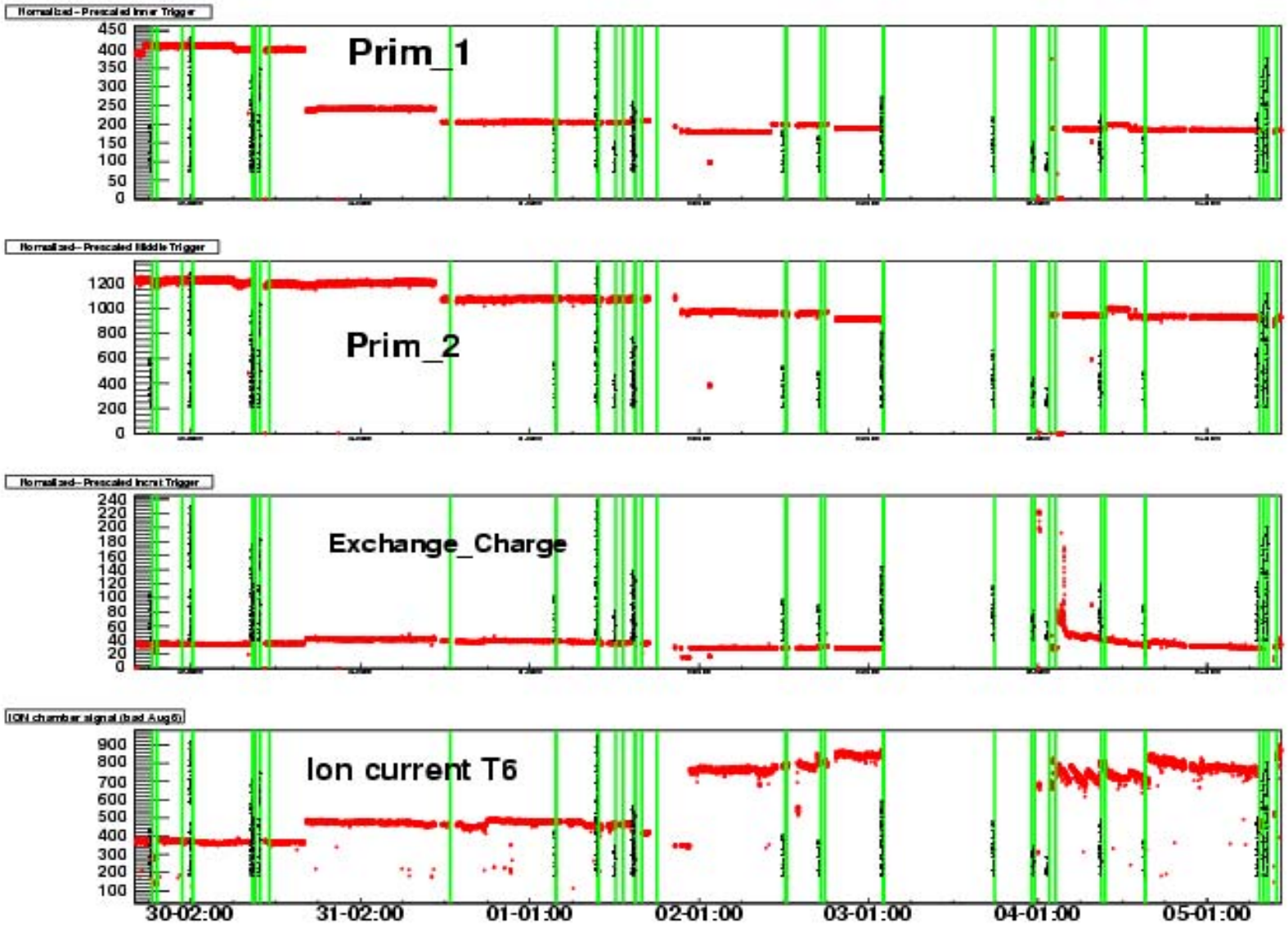


1. **MD started at 02:00 03/11.2004 02:00**
    1. **Silicon M. Becker Work on Silicon during MD - ADC of SI02X was exchanged again. SI02V was inspected, maybe a loose power connector.**
       - HV for SI03UV was raised by 20 V in order to compensate higher noise due to radiation damage
       - baseline of SI03X was raised (VPSP +5)
       - new pedestals were taken for all stations and loaded
    2. **Primakoff_trigger**
        1. **V.Polyakov Multiplicity counter Install new scintillator with 3mm thickness and 49 mm diameter, instead old scintillator with 5mm thickness and 45mm diameter.**
        2. **V.Polyakov Target beam scintillator Change position for target beam scintillator. New position is between SFI1 and Inner Veto, previous position was between SI2 and VetoBox.**
        3. **Sadwich_2 was remove to ScFi_1, and PM where reinstalled.**
    3. **MM Procureur *MM* MM1 To investigate problems encountered in MM01U, ports 14 and 15, MM01UV has been removed from its normal position from 9 a.m to 6 p.m…. Thresholds and HV are now standard again.**
    4. **ECAL2 S.Donskov PEDESTAL's for SADC's**
2. **End MD 03/11/2004 23:20**
    1. **After MD and exercises with a target thickness we find solution to continue data taking with PB 3mm option.**

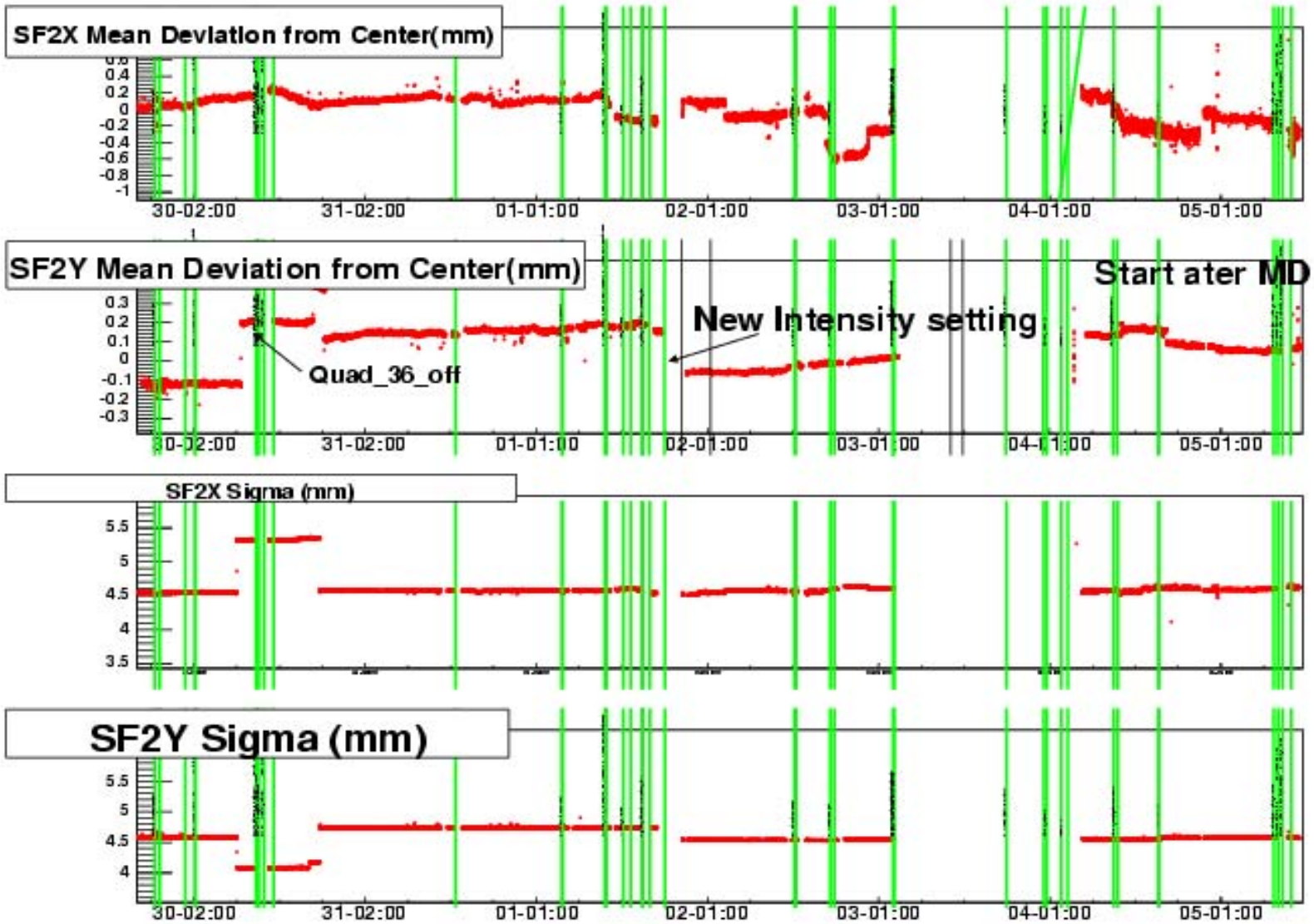
CEDAR_1_2 ACTIVITY

1. D.Demchenko 02 November 2004, 18:41Preasure changingCED1: 10.479 bar CED2: 10.279 bar D=1 mm, both CEDARs on kaons
2. D.Demchenko 02 November 2004, 20:28 preasure changing ced2 from 10.479->10.176 (from kaons to pions)
3. D.Demchenko 04 November 2004, 13:14preasure status Pressure still drifting.
   Ced1:10.4689
   Ced2:10.2673
   All tuned back on kaons.
4. A. Ferrero 04 November 2004, 09:40CEDAR trigger scintillators moved out of beam ← therefore no possible to provide presure scan
5. D.Demchenko 04 November 2004, 13:37preasure scaning Begin make new preasure scaning for finding better alignment
   C2: 10.33->10.1 bar
   C1: 10.57->10.25 bar ← not done today, see next comment (6)
6. D.Demchenko 04 November 2004, 13:52 imposible preasure scaningI can't make preasure scaning becouse console show me that we have no beam (but it exist). I return preasure to kaons.
7. A.Ferrero: 04 November: Is prepared list for CERARs preasure control - 1/1h
8. 04 November: CEDARs are included in general "Check List"
9. 05 November: CEDARs preasure scan should be start as possible ….

Trigger rate history from 29 Oct. to 5 Nov. 2004



SF2_X_Y history from 29 Oct. to 5 Nov. 2004



DAQ, Beam, SPS history fro 29 Oct. to 5 Nov. 2004

Period From: Fri, 29 Oct 2004 17:00 To: Fri, 05 Nov 2004 10:24 Calculated At: Fri, 05 Nov 2004 10:29

Length of time excluding scheduled MD: 162.40 hours

**** Efficiency of PS/SPS
a: Total SPS Circle (exclude scheduled MD): 34744.0
b: SPS spill with T6 current >30.0: 28579
c: Sum of T6 current 2233310.8
d: (=b/a) PS/SPS Efficiency: 82.3%

**** Muon Beam In HALL 888
f: SPS spill In Hall with Muon Count >100000.0: 26612
g: Sum of In Hall Muon Count: 81700879699.0
h: (=f/b) SPS Spill Get in 888: 93.1%

**** Use of SPS/Inhall Spill in COMPASS
i: Spill used with SF2X counting >100000.0: 22793
l: Sum of Used Spill SF2X count: 91976453980.0
j: (=i/f) Inhall spill used: 85.6%

Distribution of used spills:

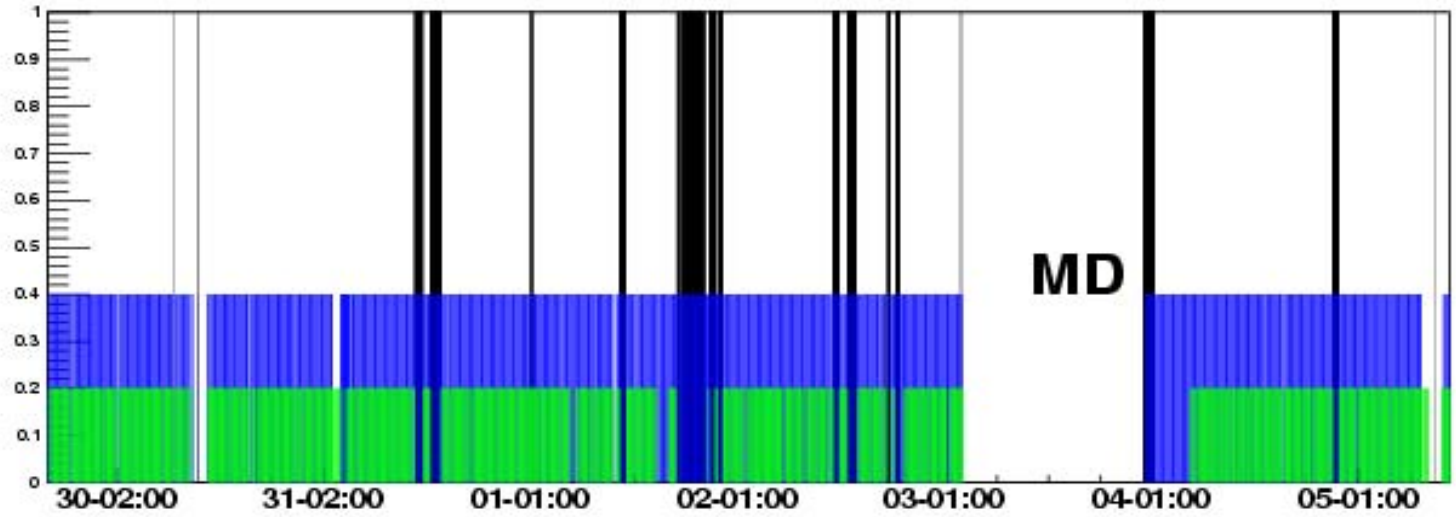
physics runs used 22704 spills, 99.6%

detector_test runs used 23 spills, 0.1%

beam_test runs used 66 spills, 0.3%

k: (=i/b) SPS spill used: 79.8%

DAQ WORKING TIME(green)/BEAM NOT IN HALL TIME(BLACK)/SPS WORKING TIME(BLUE))



Conclusions:

1. The Data taking (hadron setup) started with non stable trigger conditions:
   - removing SF4_6_7;
   - scintillation beam counters size was changed after MD;
   - initial beam setup was improved going to low intensity;
   - detectors (MM_1) was reinstalled;
   - variations of the Pb target thickness has been done.
2. Alligment was done:
   - in start of data taking (with and ON and OFF SM1,2);
   - after MD, 04.11.2004 - SM1,2 - ON.
3. Many errors from Silicons , Macro_Megas , W45 propagate S_link problems.
4. HV unstability of the ECAL2: (02 November 2004, 01:44Ecal2 HV)
5. CEDAR is under investigation: pressure stability.
6. Physical runs used 22704 till 10 o'clock 05.11.2004.
7. Hadron setup is going to stable conditions of the data taking.

Diffractive trigger

11843 05.Nov.2004 13:19 Koblitz/Poliakov/Pretz *Trigger* diffractive trigger
First diffractive trigger set up
BT * HCAL2(6 GeV) * mult * !(bk (coinc of 2/3) + sandwich + Vi)

Final setting:
BT * HCAL2(6 GeV) * mult (>330 mV) * ! (bk (coinc 2/3) + sandwich + VI)

Charge excahange trigger was off for a few hours until now
Changes timing corrected by 5ns
Mult. taken out of the veto and put in in anti-coincidence.
Reason for that: now charge exchange trigger and diffractive trigger use the same veto input

With the low HCAL threshold we decided it is enough to have only one diffractive trigger.
Diffractive trigger and charge exchange trigger activated
from run 42814 on.

Diffractive trigger prescaled by a factor 2

Trigger rate 05.11.2004, 13:53

1	Prim1 59321	59319
1	Prim2 39809	39783
2	Diff1 24137	12069
3000	Calorimeter 379557	127
10000	Beam 4285752	429
1	ChargeExchange 5420	5419

CEDARs press scan started at 12:59, 05.11.2004

11842 12:59 Demchenko *CEDAR* preasure scaning On both CEDARs
C1: 10.57->10.25
C2: 10.33->10.1

Thanks a lot
for help and cooperation!