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# COMPASS Run 2006

## Week 21.-28.7.



# Overview

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- Fri 21.7. - Mon 24.7.  
Preparations before SPS beam
- Mon 24.7. - Wed 26.7.  
**first muons in 888 since autumn 2004!**  
Beam steering, detector interventions
- Wed 26.7. - Fri 28.7.  
Trigger tuning, detector studies



# Beam in 888

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- New accelerator control system
  - ▶ New control hardware → some factors of 2 had been missing in first attempts to get beam
  - ▶ 27.7. Cumbersome search for SM2 failure:  
Key-locked red button was **not shown** as pressed
- Beam intensity has reached 1/4 of nominal intensity, gradually increasing
- Beam interlock on Bend 4/5 was not operative until this morning





M2

- Physic...
- M2 [COMPASS]
  - Magnets
  - Rectifiers
  - Collimators
  - Detectors
  - EXPTs
    - ION01
    - ION02
    - M2A\_EXP
    - M2A\_EXP
    - M2A\_EXP
    - M2A\_EXP
    - M2A\_EXP
    - M2A\_EXP
    - M2A\_EXP
    - M2A\_EXP
    - M2A\_EXP
  - SCINTs
  - MWPCs
  - FISCs
  - Obstacles
    - T6
    - ABS01
    - ABS02
    - ABS03
    - ABS04
    - ABS05
    - ABS06
    - ABS07
    - ABS08
    - ABS09
    - TARGET
  - Dumps
    - TAXs
      - TAX01
      - TAX02
    - Others

Tax Status [Explorer]

Beam: M2 / COMPASS

File: M2A.1

Explorer [Taxes]

- TAX02

Scaler Status [Explorer]

Beam: M2 / COMPASS

File: M2A.1

Explorer [Scalers]

- ION02

Run Hold Refresh

M2 Access Command

PPE221

STATUS	CHAINS	ELEMENTS	VALUES
Granted	CHAIN_M2A	SFE_NR21-006-M2	0.4
Safe		SFE_NR22-023-M2	0.0
		SFE_TAX-02-M2	139.5

OPEN BEAM ON FREE logbook STATUS

PROGRESS

Elements values received (09:33:16 AM)

PPE221 : command succeed

Logging Console

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INFO : setting CHAIN_M2A (priority=4) to 'safe'
INFO : setting CHAIN_M2A (priority=5) to 'safe'
INFO : Safety elements set to 'safe'
INFO : Set safety elements to 'safe'
INFO : setting CHAIN_M2A (priority=0) to 'safe'
INFO : setting CHAIN_M2A (priority=1) to 'safe'
INFO : setting CHAIN_M2A (priority=2) to 'safe'
INFO : Set elements with priority 2 to 'safe'
INFO : Waiting for 94 sec (maximum time)
INFO : setting CHAIN_M2A (priority=3) to 'safe'
INFO : setting CHAIN_M2A (priority=4) to 'safe'
INFO : setting CHAIN_M2A (priority=5) to 'safe'
INFO : Safety elements set to 'safe'
  
```

clear

28.07.2006

Comment: Muon beam sta

Comments

It get the required value

28.07.2006 09:12

It Muon beam start file 2

Comments



- Physic...
- M2 [COMPASS]
  - Magnets
  - Rectifiers
  - Collimators
  - Detectors
  - EXPTs
    - ION01
    - ION02
    - M2A\_EXP
    - M2A\_EXP
    - M2A\_EXP
    - M2A\_EXP
    - M2A\_EXP
    - M2A\_EXP
    - M2A\_EXP
    - M2A\_EXP
    - M2A\_EXP
  - SCINTs
  - MVPCs
  - FISCs
  - Obstacles
    - T6
    - ABS01
    - ABS02
    - ABS03
    - ABS04
    - ABS05
    - ABS06
    - ABS07
    - ABS08
    - ABS09
    - TARGET
  - Dumps
  - TAXs
    - TAX01
    - TAX02
  - Others

M2 Access Command

Magnet Status [Explorer [Magnets]]

Beam: M2 / COMPASS  
 File: M2A.1  
 Momentum: +172 / +160 GeV/c  
 Comment: Muon beam start file 20060728

Explorer [Magnets]	Read	BeamRef	Max	Info	F	Comments
▲ BEND01	558.0	558.2	1500	NR22-060		
▲ BEND02	0.0	947.0	1550	NR21-006		STANDBY / <=>BeamRef / Not Operational / RB
▲ BEND03	0.0	635.7	1500	NR22-023		STANDBY / <=>BeamRef / Not Operational / RB
▲ BEND04	-494.2	-494.5	1000	NR22-042		
▲ BEND05	689.2	689.0	1500	NR22-038		
▲ BEND06	-734.8	-735.0	1500	NR22-041		
▲ BEND07	-13.9	-14.0	800	NR21-039		
▲ BEND08	0.0	-351.0	800	NR21-038		<=>BeamRef / Not Operational / CT
▲ BEND09	16.9	17.0	800	NR21-036		
▲ BEND10	0.0	0.0	2500	NR31-003	F	
▲ BEND11	0.5	4008.0	5000	NR41-001	F	<=>BeamRef / Not Operational / MO / SF
▣ MIB01	-100.2	-100.0	250	NC11-040		
▣ MIB02	-99.8	-100.0	250	NC11-033		
▣ MIB03	-100.1	-100.0	250	NR11-078		Not Operational / DF
▣ MIB04	-100.1	-100.0	250	NR11-123		
◆ QUAD01	174.6	174.7	550	NR11-005		
◆ QUAD02	-317.6	-317.7	550	NR11-006		
◆ QUAD03	301.0	301.1	550	NR11-007		
◆ QUAD04	301.0	301.1	550	NR11-008		
◆ QUAD05	0.0	0.0	550	NR11-009		
◆ QUAD06	-317.6	-317.7	550	NR11-010		
◆ QUAD07	135.6	135.6	500	NR11-028		
◆ QUAD08	-314.4	-314.4	530	NR11-029		
◆ QUAD09	-300.1	-300.2	500	NR11-030		
◆ QUAD10	245.2	245.3	500	NR11-031		
◆ QUAD11	-290.3	-290.3	500	NR11-032		
◆ QUAD12	-357.9	-358.0	750	NR21-008		
◆ QUAD13	480.9	481.0	750	NR21-005		
◆ QUAD14	-480.9	-481.0	750	NR21-012		
◆ QUAD15	480.9	481.0	750	NR21-013		
◆ QUAD16	-481.1	-481.0	750	NR21-014		
◆ QUAD17	459.7	459.8	750	NR21-026		
◆ QUAD18	-459.6	-459.8	750	NR21-015		
◆ QUAD19	252.4	252.5	750	NR21-017		
◆ QUAD20	-310.6	-310.6	500	NR11-058		

Run  Refresh All  Refresh Selected  
 Hold  Refresh Selected

# Target

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- Magnet

- ▶ 27.7. Helium supply valve closed, only discovered when He level was 60%. → safety shutdown of current.

loss of the polarisation ( $\sim 41\%$ ), refilling

- ▶ Magnet switched on to nominal current (fast discharge, again level loss to 35%)

- ▶ Slow control (alarms) to be improved in near future

- Polarisation starts tomorrow



# BMS and SciFi detectors

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- BMS: Some interventions were necessary (PMT, cabling)
- SciFi 02 front-end power supply not operating in solenoid fringe field, temporary fix
- ready for beam



# Silicon detectors

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- Latency scan done
- CAEN crate  $\leftrightarrow$  DCS communication problem
- ready for beam





# Micromegas detectors

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- 12/12 planes operating
- fringe field of target solenoid influences first station
- further studies necessary (run with lower solenoid field?)
- plateau study done with zero solenoid field, performances also measured with 1 T, 2.5 T



# Saclay DC

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- DC00, 01 working
- new DC04
  - ▶ strong el.mgn. pick-up 40 MHz, many investigations necessary
  - ▶ noise level reduced to acceptable range
- plateau and calibration studies done for all 3 detectors
- next step: commissioning in full intensity beam



# GEMs

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- GEM positions centered about beam
- problems with CAENnet communication
- plateau studies done
- ready for beam



# Straws

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- sensitive to temperature profiles
- some HV channels unstable
- readiness for beam?



# RICH

- Gas system
  - ▶ N<sub>2</sub> test showed leak in supply line  
after fixing: normal leak rate (120 l/d)
  - ▶ filling with C<sub>4</sub>F<sub>10</sub> completed on 25.7. to 95.8%
  - ▶ transparency as in 2004 end-of-run
  - ▶ 27.7. leak ~ 600 l/d observed, fixed at vessel bottom
  - ▶ new leak rate < 150 l/d
- PMT: read-out ready, photon signals timed in, first rings!
- APV: read-out ready, no in-time signals seen yet  
(bad trigger conditions?)



# RICH

- PD: all HV sectors on,  
1 plane drives higher current (200 M $\Omega$ )  
→ high intensity test needed
- Cooling: operational, some leaks still to be cured
- Slow control **missing**
  - ▶ LV (Wiener)
  - ▶ PD HV (urgent)
  - ▶ MAPMT HV
  - ▶ gas alarm **critical!**
- Next step: look at data with reconstructed tracks



# Calorimeters - ECAL1

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- HV ok
- read-out not yet working, S-ADC programming will be needed (next week)



# HCAL1 & 2, Muon walls

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- HV ok, read-out ok
- implementation of HCAL1 in trigger to be done





# Calorimeters - ECAL2

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- LED pulses ok
- timed-in
- HV calibration?



# Trigger system

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- HV settings, timing scan done
- Further setting-up ongoing as soon as beam is back
- HCAL1 trigger



# DAQ system

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- DATE 5 running stably
- Rate limit observed with all equipment  $\sim 25\,000/\text{spill}$



# DCS

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- 27.7. critical incident: all CAENnet-controlled detectors are put into unwanted state by unintended “broadcast” of current setting
- debugging ongoing



	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu
	24	25	26	27	28	29	30	31	01	02	03	04	05	06	07	08
no beam			x						xxxx	x						
Beam commis.	c															
-----																
Si latency	Beam	l										3 hours				
check trackers		lll										GEM positioning, DC01 hot spot with & w/o field				
align data	align	l														
trg HV, mat, coin			H H	H HHH												
SF/BMS scan	Beam		H H													
RICH-APV latency	HCall		H H	H HHH												
HCal2 calib	Halo		H H	H HHH			HHHHHH									
HCall1 calib	Halo		l	l		l								3 x 5 hours		
DC0/1 RT plateau	Halo		l	l												
RICH-PMT timing	Phys				lll											
Ecal2 calib						eeee				ee	eeee					
HCall1 thrhld (trg)							HHHHHH									
straw RT	Halo						H							needs align		
GEM plateau	Vi+Halo						HH							"	"	
MM plateau	B+Vi+Halo						HH							"	"	
DC4 RT plateau	Halo								l							
ECall1 calib	Halo						HHHHHH							HHHHHH		
														^		
														^		
														^		
																data taking can start

l: low I  
H: high I  
e: electron

		Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu
		24	25	26	27	28	29	30	31	01	02	03	04	05	06	07	08
no beam					x						xxxx		x				
Beam commis.		c															
-----																	
Si latency	Beam	l															
check trackers		lll															
align data	align	l															
trg HV, mat, coin			H H	H	HHH												
SF/BMS scan	Beam		H H														
RICH-APV latency	HCall		H H	H	HHH												
HCal2 calib	Halo		H H	H	HHH				HHHHHH								
HCall1 calib	Halo		l		l			l									3 x 5 hours
DC0/1 RT plateau	Halo		l		l												
RICH-PMT timing	Phys					lll											
Ecal2 calib								eeee				ee	eeee				
HCall1 thrhld (trg)								HHHHHH									
straw RT	Halo							H									needs align
GEM plateau	Vi+Halo							HH									" "
MM plateau	B+Vi+Halo							HH									" "
DC4 RT plateau	Halo										l						
ECall1 calib	Halo								HHHHHH								HHHHHH
																	^
																	^
																	^
																	data taking can start

l: low I  
H: high I  
e: electron