



CALICE @ CERN 2007

Installation and Run Plan



E. Garutti

<http://calice-cam1/>



Outline

- DESY preparation and shipping (Felix)
- CALICE @ CERN 2007
- CERN Installation plan
 - Detectors
 - Additional hardware
 - Computer
- About the shifts
 - Shift rules
 - Shift schedule
- About the physics
 - Run plans
 - Energies and angles

12-MARCH-2007 2007 SPS Fixed Target Programme

Version 2.1

Colour code: blue (dark shading) = not yet allocated ; yellow (light shading) = not allocatable or Machine Development

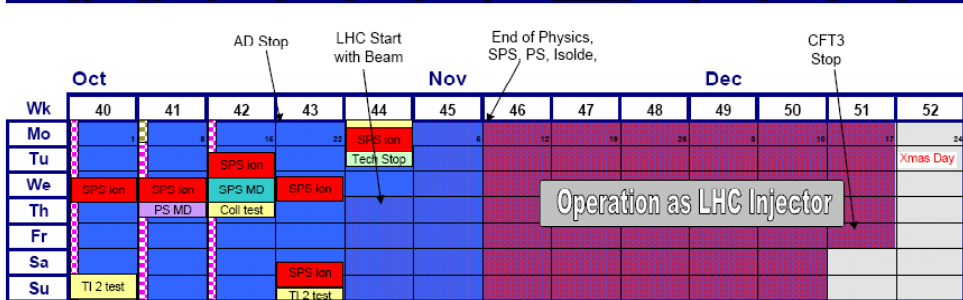
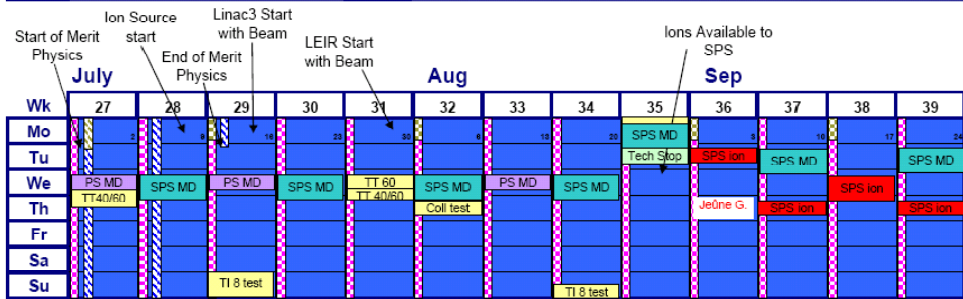
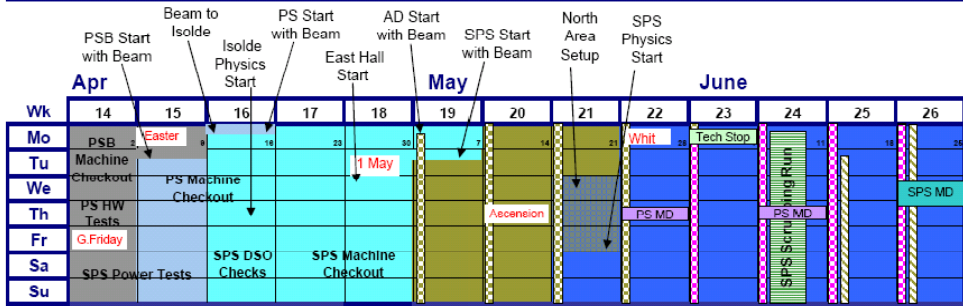
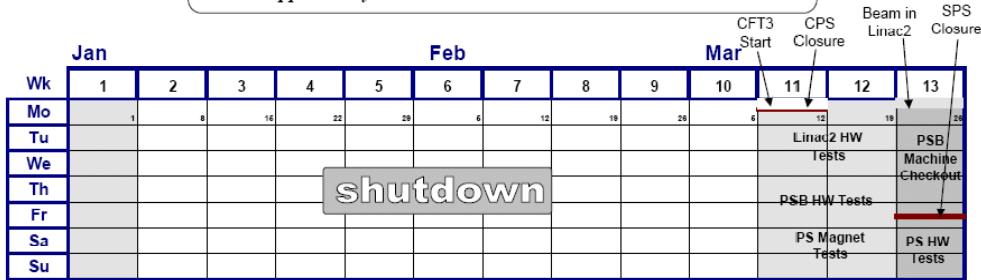
	P1A	P1B	P2	P3	P4	P5												
	21 2 May 23 May	26 23 May 18 Jun	37 18 Jun 25 Jul	41 25 Jul 4 Sep	36 4 Sep 10 Oct	33 10 Oct 12 Nov												
T2 -H2		EA CMS ZDC R&D 2 5 11	CMS SIR&D 9	CMS Combined 23	CMS Combined 14	CMS HCAL R&D 12	CMS CASTOR 14	PHENIX 9	CREAM 6	CHERCAM 8	NA49 FUTURE 13	NA49 FUTURE 19	PAMELA /	NUCLEON /				
T2 -H4		EA CMS EACL 2 16	DRFAM 7	DRFAM 8	ECC 7	AMS RE1 7	SITRD 7	CMS ECAL 21	GI AST 8	LHCf 11	I HCF 7	BRAN 8	CMS ECAL 21	CRYSTAL 26	EA Te 4	3		
T4 -H6		EA CFRF 2 6 3 7	ALICE ZDC 9	RD42 7	CALICE 14	ALICE ECAL 7	ALICE ECAL 14	CALICE 14	RD42 5	RD42 8	MONOPIX 7	DEPFET 6	CFRF 8	MOBOM 6	DESY TELESCOPE 7	SILC R&D 14	RD42 12	MONOPIX 7
T4 -H8		EA RD?? 2 16	EA I HCh 2 14	ATLAS LUCID 7	ATLAS BCM 7	ATLAS ZDC 7	I HCh 14	TOTFM 14	I HCh 13	ATLAS 3DSI 9	EA Test 6	RD?? 14	ATLAS RP 7	ATLAS RP 19	RD?? 14			
T4 -P0				P326 37				P326 41				P326 36			P326 33			
T6 -M2		EA COMPASS 2 16		COMPASS 37				COMPASS 41				COMPASS 36			COMPASS 33			
CNGS																		

Scrubbing & MD/ CALICE Installation

CERN 2007

2007 Accelerator Schedule

Approved by the Research Board 29th November 2006



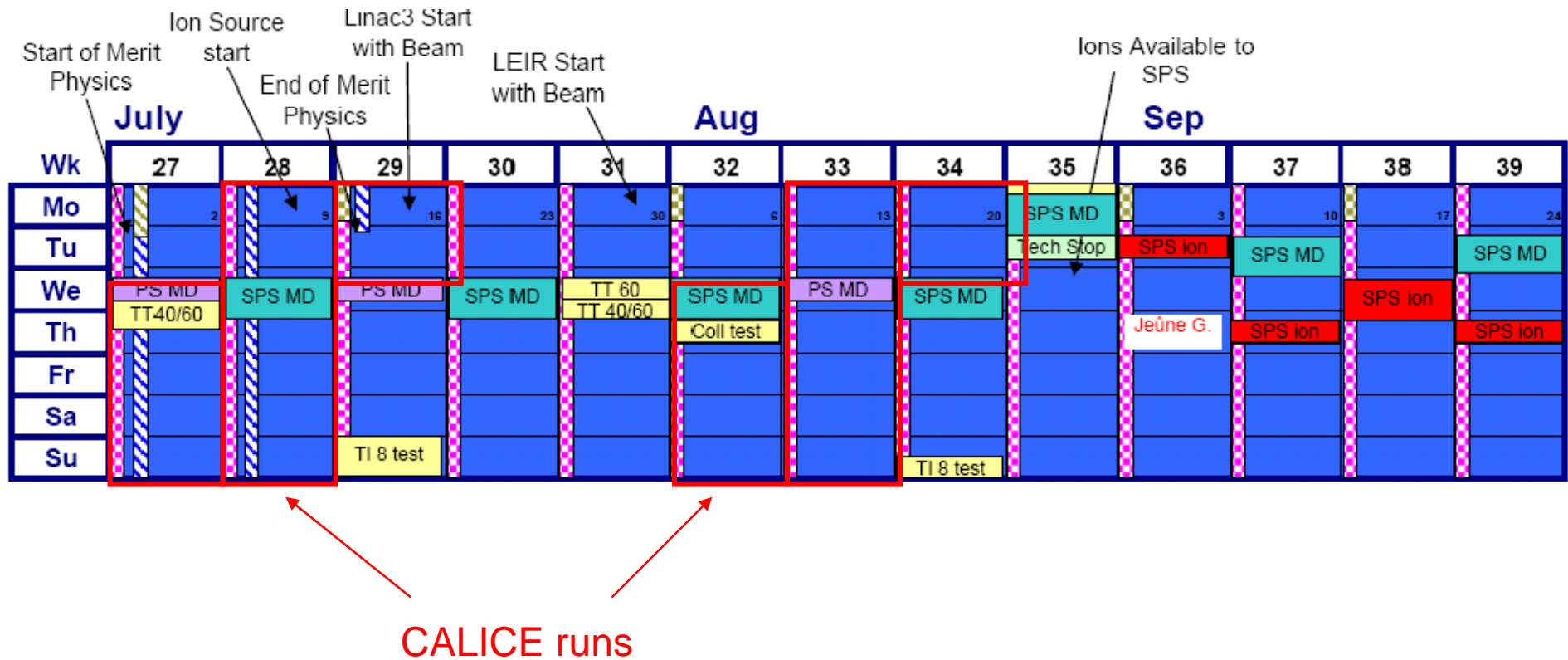
- PS MD
- Dedicated SPS Proton MD
- Dedicated SPS Ion MD
- Special Dedicated Test
- SPS Scrubbing Run
- Weeks with AD Physics
- AD Setting up
- Weeks with Merit (nToF11) Physics
- Merit Setting up

Official Accelerator schedule:

- MD marked
- No super cycle specified yet



Accelerator schedule





Installation plans: the detectors

→ Installation week: 11th - 17th June

Work needed before installation:

- Removal of concrete blocks
- Pion/proton separation ??
- Provide additional 32 A plug to the area

Mon	Tue	Wed	Thu	Fri	Sat	Sun
11. Jun	12. Jun	13. Jun	14. Jun	15. Jun	16. Jun	17. Jun
1	2	3	4	5		
INSTALLATION						

Installation steps:

- Day 1) Positioning and alignment on movable stage / unpacking
- Day 2-3) Insertion of HCAL modules with crane (!) → 38 modules !!!
- Day 2-3) ECAL installation in parallel
- Day 2-3) Cable connection (cables will remain in place from DESY)
- Day 3-4) Installation of TCMT modules
- Day 4-5) Installation of trigger system
- Day 4-5) Bridge from stage to TCMT (!)
- Day 4-5) Bridge from stage to trigger/MWPC (!)

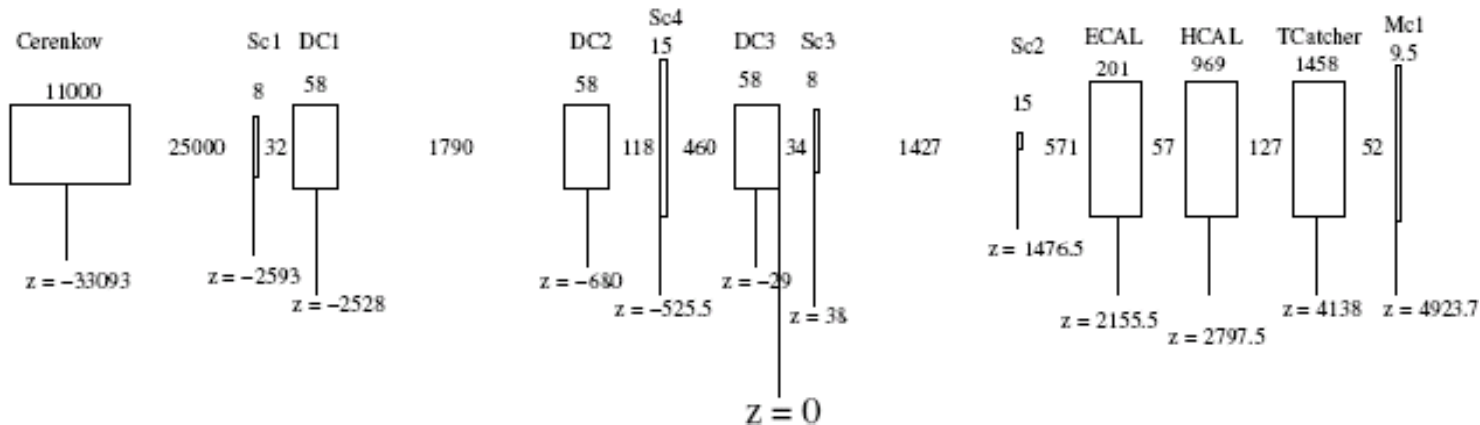
Any additional detector?



The trigger system

- New veto wall:
 - 1x1 m² counter with 20x20 cm² hole for beam (real veto)
 - 1 X₀ lead in from as pre-shower (outside the 20x20 cm²)
- Muon trigger from NIU repaired + faster PM
- Main trigger unchanged
 - 10x10 cm² and 3x3 cm² coincidence

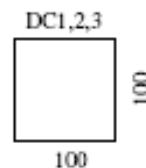
TOP – CERN October 2006



E. G

FRONT

Sc2 is 30x30
Sc1 and Sc3 are 100x100
Sc4 is 200x200



Mc1 is 1000x1000

All distances are in mm



Computers and DAQ

- Installation of computers and DAQ has to start on June 11th
 - ➔ First data transfer expected end of the week
- Main DAQ: no changes
- Slow control: movable stage integration
 - Modification of DAQ
 - Modification of converter / LCIO
 - Can be tested already before CERN (?)
- Analysis PC:
 - New caliceana (online monitor), to be tested
 - Extra PC for LCIO-based analysis in control room (?)
- Redundant power supply ??
- New wish list for online monitor ➔ comes later

	Mon 11. Jun	Tue 12. Jun	Wed 13. Jun	Thu 14. Jun	Fri 15. Jun	Sat 16. Jun	Sun 17. Jun	Mon 18. Jun	Tue 19. Jun	Wed 20. Jun	Thu 21. Jun	Fri 22. Jun	Sat 23. Jun	Sun 24. Jun
0:00-8:00	1	2	3	4	5									
8:00-16:00	INSTALLATION					COMMISSIONING								
16:00-24:00														

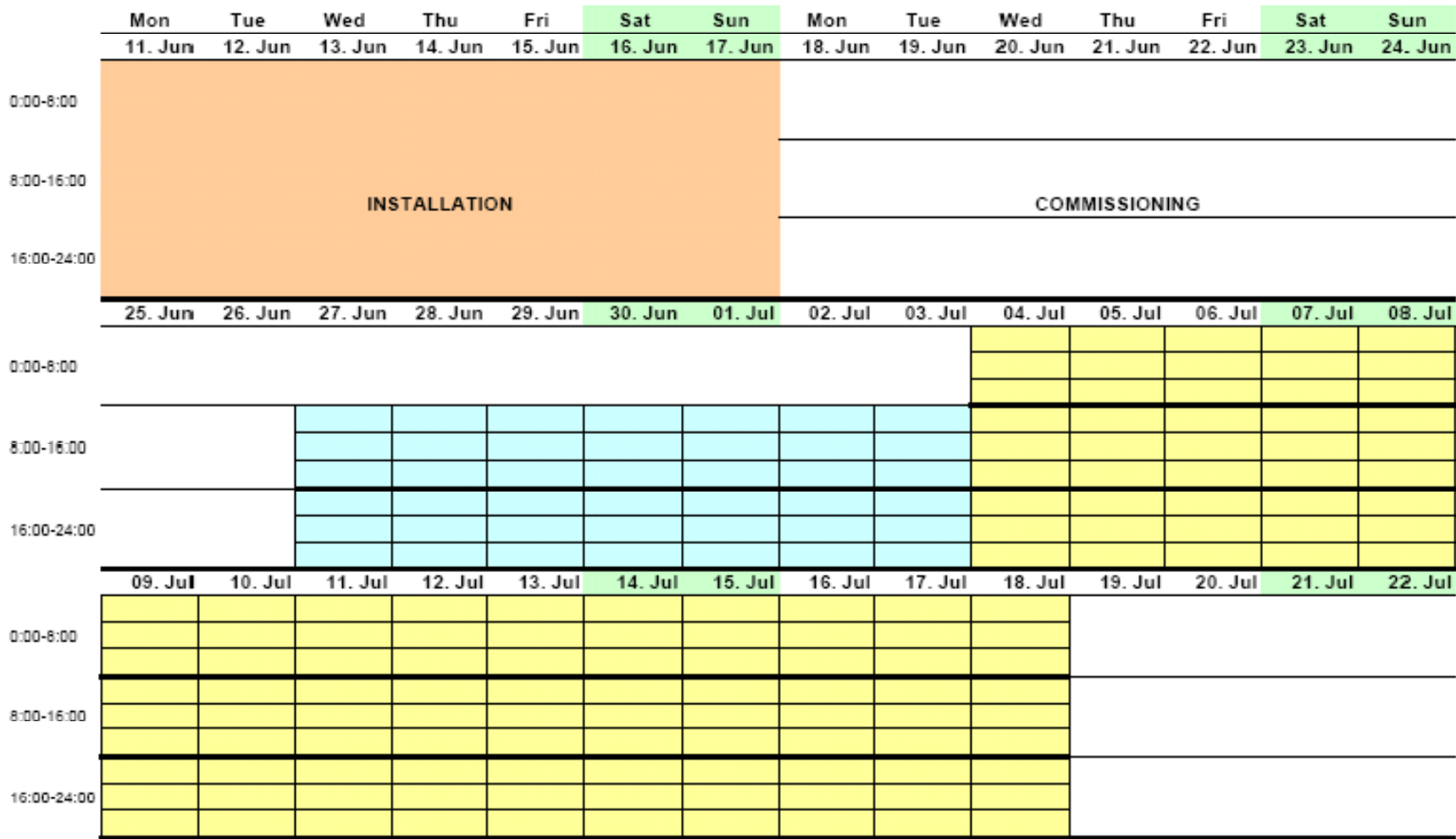


Shift organization

- 2 main physics periods + 2 muon calibrations
- No strong distinction between ECAL and HCAL
 - We work all for the same CALICE project
- 1 shift schedule

- Group leaders please collect list of shifters from each institute
- Indicate periods of availability > 1 week
- Send list to me **within May 15**
- Schedule will be made (by me and Fabrizio) according to shift rules
 - next to come

CERN shift schedule 2007



- Muon calibration, only day shifts, 6 people/day
- Phys. data taking, full shift, 9 people/day

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun
	23. Jul	24. Jul	25. Jul	26. Jul	27. Jul	28. Jul	29. Jul	30. Jul	31. Jul	01. Aug	02. Aug	03. Aug	04. Aug	05. Aug
0:00-8:00														
8:00-16:00														
16:00-24:00														
LONG BREAK														
	06. Aug	07. Aug	08. Aug	09. Aug	10. Aug	11. Aug	12. Aug	13. Aug	14. Aug	15. Aug	16. Aug	17. Aug	18. Aug	19. Aug
0:00-8:00														
8:00-16:00														
16:00-24:00														
	20. Aug	21. Aug	22. Aug	23. Aug	24. Aug	25. Aug	26. Aug	27. Aug	28. Aug	29. Aug	30. Aug	31. Aug	01. Sep	02. Sep
0:00-8:00														
8:00-16:00														
16:00-24:00														

Group leaders: please send list of shifters within 15th of May !!!



Shift rules

- each shift consists of 3 people:
 - ECAL person, HCAL person, analysis person (at least one experienced)
 - Each shift team will be assembled according to duty sharing & experience
 - A shift period has a minimum of 4 shifts
 - The official language on shift is English
 - Before starting of first shift everybody has to follow shift instruction
 - Shift instruction is given 2-3 times a week: Mon/Wed/Fri morning 10:00
 - People who have not attended shift instruction in '07 can't take shifts
 - No additional analysis / private work can be carried on during shift
- I relay on the group leaders to help organizing shifts in an efficient and responsible way
- Last year we did good, this year we need to do better!



The run plan

- Based on last year experience the run plan has to be flexible!
- Define energy and angle points
- Define two levels of importance for a point (priority I and II)
- Define minimum number of events for a significant point

- The run plan will evolve depending on beam conditions / agreements with other users / other unpredicted constraints

- Better to have “packages” of run plan exchangeable
- Leave time plan for CERN after discussion with other users



Data rate considerations

From 2006 experience:

- Detector up time > 90%
- Beam duty cycle > 60% (excluded 1st period cancelled)
- Beam super-cycle = 16 sec (24 sec for 20% of time)
- DAQ average rate (including energies) ~ 60 Hz

Expected for 2007:

- same
 - same
 - Beam super-cycle = 34 sec (~ 1/2 rate)
 - DAQ average rate ~ 30 Hz
- 500 k events ~ 4.5 h

Data rejection on October data:

Run #	E[GeV]	tot ev.	Trash	low E_{beam}	muons	h in HCAL	HCAL no leak	HCAL leakage	TCMT only
300628	6	284648	599	142363 50%	53364 19%	70162 25%	62766 22%	3793 1%	3603 1%
300613	10	584423	1538	298376 51%	60403 10%	201780 35%	146686 25%	37703 6%	11471 2%
300616	20	580772	1712	285118 49%	33061 6%	239562 41%	95077 16%	94764 16%	11525 2%

M. Groll

Data rejected: 50% + up to 20% → 20-40% data for analysis
 → electron contamination 0% / no cut on MWPC



Our requirements

- Energy points:
6, 8, 10, 12, 15, 18, 20, 25, 30, 40, 50 GeV (priority I)
- The detector angles:
0, 10, (15 ?), 20, 30
- Minimum number of events per point: 500 k

Remarks:

- rotation is time consuming, only every second day
- If more time available at one angle high statistics has priority over more energy points (i.e. first collect 1 M ev for priority I , then cover priority II)

In addition:

ECAL electron runs: (from Fab.) repeat 6/8/10 GeV with high stat. if possible also higher E
0 deg. priority, if time 30, 45 deg

HCAL stand alone: minimum 3 days required for sys. check w/o ECAL → beam energy degradation

HCAL stand alone: 1-2 days for electromagnetic program (?)

- HCAL stand alone at end of one period (to avoid ECAL re-installation during data taking)
- Order of runs depends on agreement with H8 users (when do we have low E?)



Proposed run packages

- 1) Combine physics packages Low E
 - **Priority I:** 1 M ev at 6/10/15/20 GeV @ 0 deg +
500 k ev 6/10/15/20 GeV @ 20,30 deg (~5 days)
 - Priority IIa: 500 k ev at 8/12/18 GeV @ 0,20,30 deg (~3 days)
 - Priority IIb: 500 k ev 6/10/15/20 GeV @ 10,15 deg (~2 days)
- 2) Combine physics packages High E
 - **Priority I:** 1 M ev at 25/30/40/50 GeV @ 0 deg +
500 k ev 25/30/40/50 GeV @ 20,30 deg (~ 5 days)
 - Priority IIb: 500 k ev 25/30/40/50 GeV @ 10,15 deg (~ 2 days)
- 3) ECAL runs (electron) Low beam E required
 - Priority I: 500 k ev 6/8/10/15/20 GeV @ 0 deg (~ 1 day)
- 4) HCAL alone (remove ECAL) :
 - Hadronic run: 2 options depending on beam E available
 - 1) 1 M ev at 6/10/15/20 GeV @ 0 deg (~ 2 days)
 - 2) 1 M ev at 25/30/40/50 GeV @ 0 deg (~ 2 days)
 - Electron run: requires Low beam E (as for ECAL package)
 - 300 k ev 6/10/15/20 GeV @ 0 deg (~1 day)
 - test of integrated el. slab 50 GeV el beam (~1 day)

Beam tuning time not included!!!



More monitoring / more analysis

Wish list for online monitor:

- Calibrated energy sum of 3 detectors → cross check of beam E
- beam spot (integrated over run) → check alignment, beam spread

More analysis during data taking:

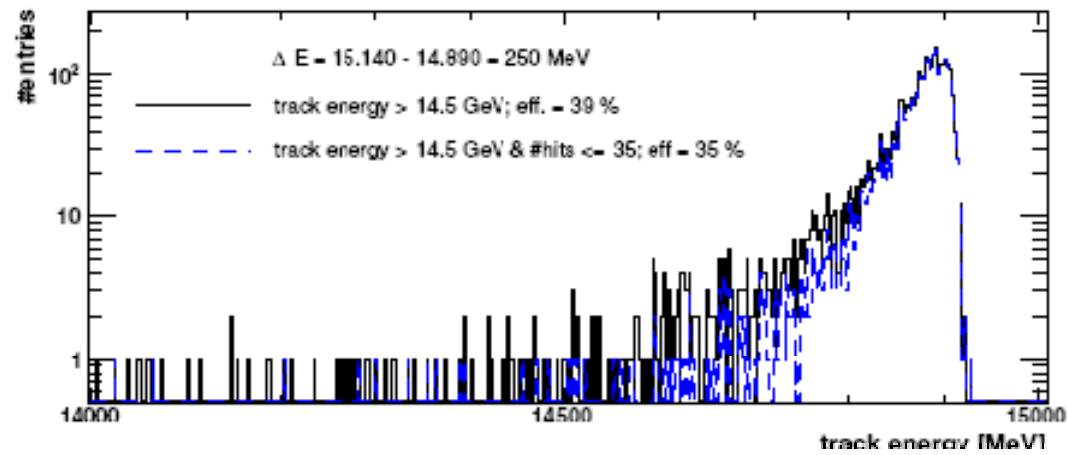
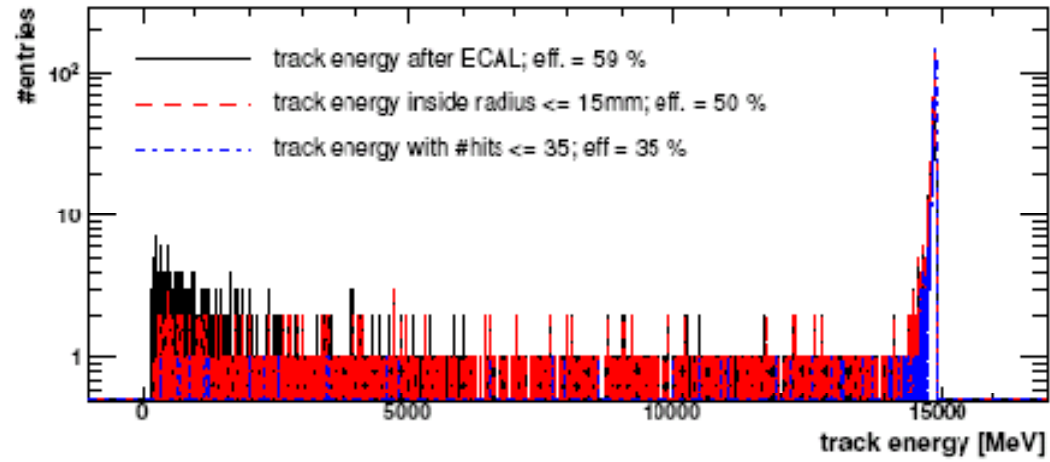
- Local: more checks for beam quality, energy spread comparison between runs, ...
- Remote: more support from people not on shift
participation to daily meeting, preliminary results, check of detector stability / noise, check of log-book entries, feedback on calibrations monitoring system, ...

proposal: test of “virtual control room”, i.e. remote shifts in support to local ones to check converted files with “virtual-online monitors”



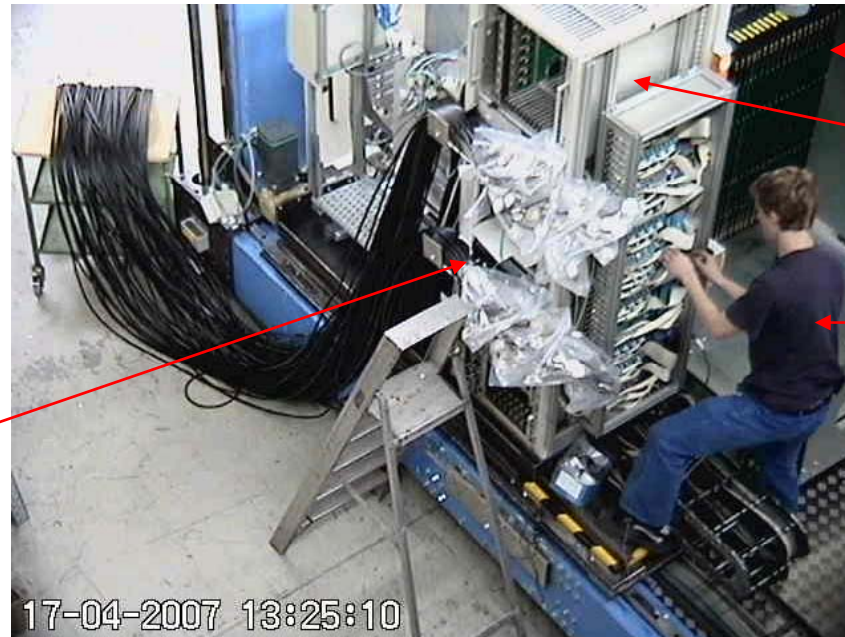
Last year we did great !

This year we have to do greater !



DESY preparation

- Movable stage integration (ECAL+HCAL) at DESY:
 - HCAL modules 1-23 installed on stage
 - ECAL slabs arrive on 24th of April: 15 + 6 new slabs
 - Cabling being done: readout this week, power this/next week
 - 1st grounding test before end of April



HCAL modules

ECAL VME

Thorsten working

HCAL VME

E. Garutti



DESY preparation ...cont

- CMB (HCAL LED system) tuning in May
about 15 working days needed to:
 - check 23 CMB tuned at CERN
 - repair bent LED & PIN
 - tune 15 new CMB
- Study new physics mode: ASIC injection R OFF (lower noise)
- Adjust gain of all SiPM to be < ADC saturation
- Test does not include:
 - Trigger system, TCMT integration, MWPC and Cherenkov r/o

In // @ the DESY Test Beam:

Modules # 24, 26, 28, 30 tested last w.e. → 24 repair “dead” channels

Modules # 25, 27, 29, 31 installed today (scan over w.e.)

Modules # 32-38 to be tested when ready



Shipping from DESY

- movable stage in special container (Gert)
- Active detector components separately in boxes
- Shipment week 4-8 June
- ~ 1 week needed for packing → start already during LCWS (29 May)

Detector + installation team at CERN

