

Overview of EMCAL tasks

To do's before data taking

Short term objectives

- Physics for the first pp and AA run (October 2009- November 2010)
 - ▶ π^0 , η production cross section and p_t spectrum
 - ▶ Total transverse energy E_t
 - ▶ Direct photon cross section and p_t spectrum
 - ▶ Direct photon - charged hadrons correlations

Coordination

- Two coordinators should be nominated now
 - ▶ An online coordinator for all P2 activities: make EMCal ready to take data
 - ▶ An offline coordinator for all software activities: make EMCal software ready to process and analyze data

John Harris 20 May 2009

Timely!

Need coordinators to be able to match people with tasks, get commitments and see more results

Color code

- Only pending tasks are listed
 - ▶ Tasks with sufficient identified manpower
 - ▶ Tasks with insufficient or unidentified manpower

At P2

- 4 SM (SMC0, SMC1, SMA0, SMA1)
 - ▶ SMC0, SMC1 hardware installed
 - ▶ US SM2 will be 18/06 at CERN (Tom)
 - ▶ EU SM2 will be at Grenoble 22/06 (Nicolas)
 - ▶ Both inserted in ALICE by third week of July
 - ▶ **Install services and test**
 - ▶ $80^\circ < \phi < 120^\circ ; -0.7 < \eta < 0.7$

Cosmic calibration

- Uniform response of towers to cosmics μ
 - ▶ Finalize analysis for EU SMI
 - Analyze pedestal run (EU SMI)
 - Study temperature dependance (EU SMI)
 - Store calibration parameters in DCS Config DB
 - ▶ Repeat all for US SM2 and EU SM2 in June

NEED PEOPLE AT
CERN NOW

Cosmics run



- Commissioning
 - ▶ DCS control (Creighton):
 - setting HV, running conditions,... PVSS
 - software (FEE, LED, Trigger, ECS, GUI)
 - ▶ LED system: install LCU, test data taking
 - ▶ Test BusyBox

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Cosmics run



- Commissioning
 - ▶ Trigger (CERN, Grenoble)
 - TRU code
 - integrate and test TRU+STU
 - thresholds, rate and efficiencies for L0 and L1
 - HLT (LBNL)
 - reconstruction, L1, E/p
 - test

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Cosmics run



- Commissioning
 - ▶ Upgrade FEE firmware
 - ▶ DAQ integration and test (June !!!!)
 - ▶ Rate tests (samples, ZS, SD,...)
 - ▶ Export run conditions (T) to offline

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Cosmics run



- Calibration
 - ▶ Demonstrate calibration strategy
 - gain matching (APD bias), T/LED corrections
 - absolute gains, time dependence
 - position calibration
 - ▶ DA to be exercised at P2: LED amp vs t, deadmaps, pedestals
 - ▶ Pedestals for ZS

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Cosmics run



- Monitoring

- ▶ AMORE:

- pedestals, gain, dead/alive
- User friendly Raw QA (LBNL)

- ▶ HLT: invariant mass, trigger efficiencies, track matching (LBNL)

I want you



Offline software

- Geometry
 - ▶ Run I geometry (Gustavo)
 - ▶ mis-alignment and survey data
- Simulation
 - ▶ Response function (energy deposited into photo-electrons)
 - ▶ Time associated to hits and test beam time resolution
 - ▶ Trigger (Rachid)

I want you



Offline software

- Reconstruction
 - ▶ Pulse shape fit (Alexei)
 - ▶ Include bad channels map (Gustavo)
 - ▶ **mis-alignment**
 - ▶ **cluster unfolding**
 - ▶ Track matching (Jenn)
 - ▶ PID (Marie, Amaya)

I want you



Offline software

- QA
 - ▶ Detector QA (raw data), Algorithm QA (David, Sevil)
- Calibration
 - ▶ Absolute gain (t) using π^0 mass (Gustavo++)
 - ▶ Electrons E/p
 - ▶ MIPs

I want you



Offline software

- $$E \frac{d^3\sigma}{dp_T^3} = \frac{1}{2\pi p_T \Delta p_T} \cdot \frac{1}{LT} \cdot \frac{1}{Br} \cdot C_{\text{trig}} \cdot C_{\text{geom}} \cdot C_{\text{rec}} \cdot C_{\text{offvtx}} \cdot N^{\pi^0}$$
- ▶ raw π^0, η spectrum from LHC09a4 (pp@10 TeV MB)
- ▶ acceptance \otimes reconstruction efficiency (MC)
- ▶ conversion probability (MC)
- ▶ energy smearing effect
- ▶ trigger efficiency (MC)
- ▶ off vertex contribution

I want you



Offline software

- MC production
 - ▶ Need coordination, in particular participation to the weekly production review