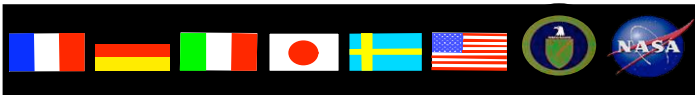# The CU Beam Test at CERN
Status Report and highlights from workshop II

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LAT C&A Meeting

May 22 2006

Beam Test Schedule Threat from CERN

- **CERN beam test schedule subjected to changes**
  - **major failure at PS power supply requires 6 weeks for repair**
  - **first 6 weeks of physics program, scheduled to start today, have been cancelled**
    - **first beam expected on july 3 at PS, july 24 at SPS**
  - **new users schedule in preparation and to be approved by CERN Research Board (next meeting june 7)**

- **CU activities proceeding on the assumption that previous schedule is still valid for us**
  - **CU integration complete (see next slide)**
  - **AD and DAQ available, currently working on upgrades**

The GLAST-LAT Calibration Unit
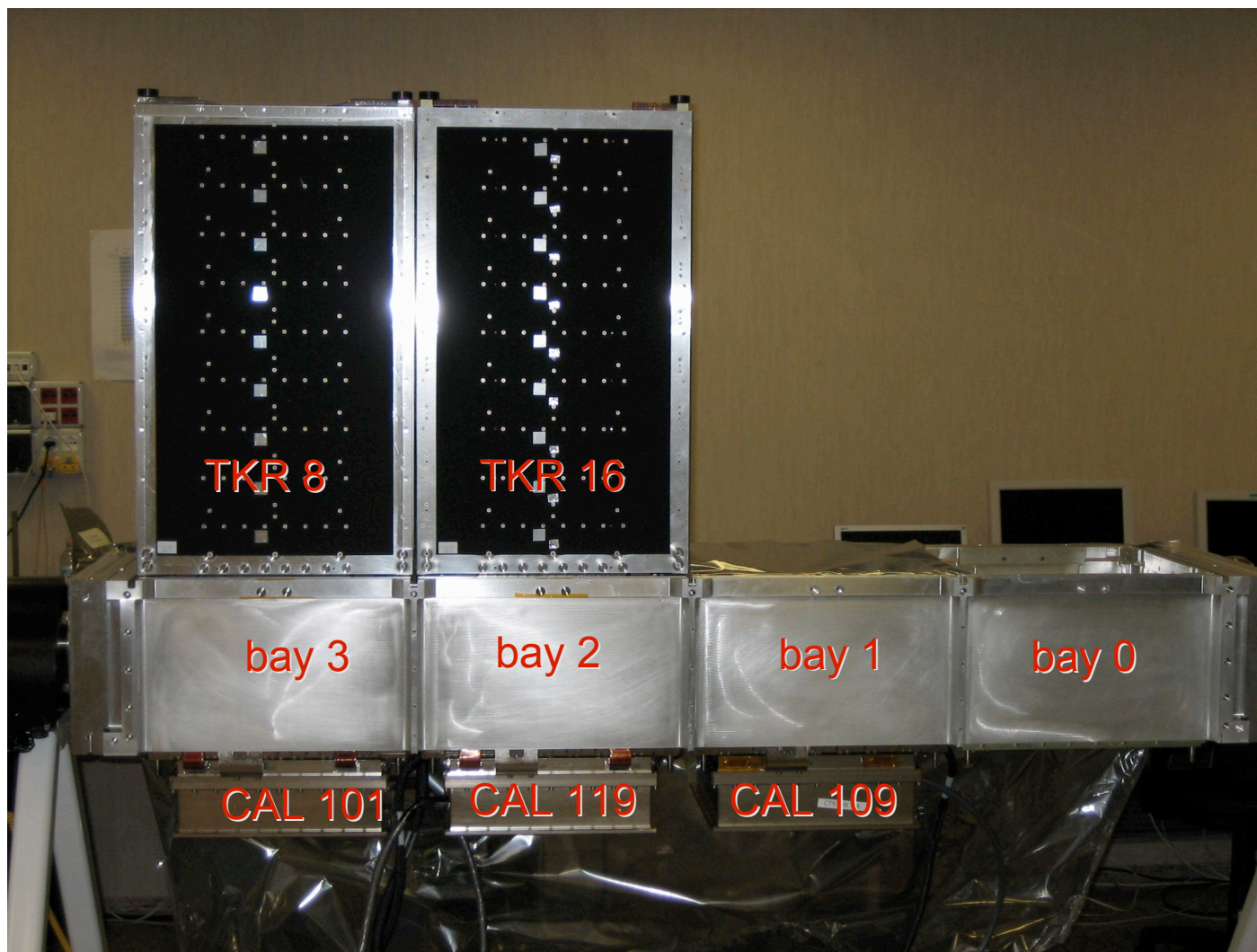
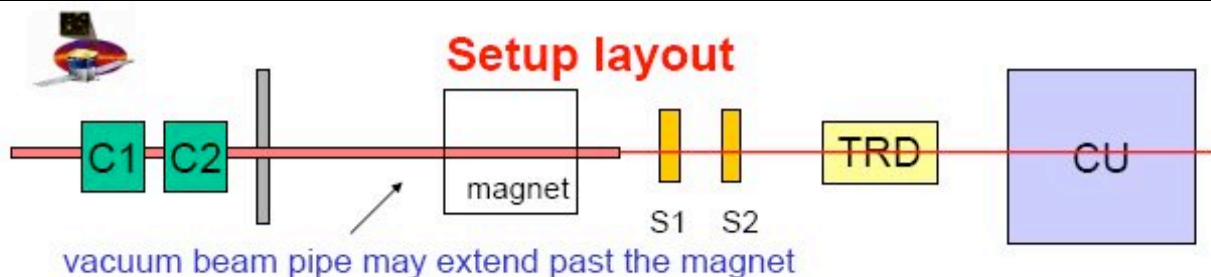**CU integration completed may 19 – currently under test**

CU Beam Test Workshop Summary

- **Very successful meeting**
  - **39 attendees (25 from INFN, 4 from France, 8 from US, 2 from Sweden)**
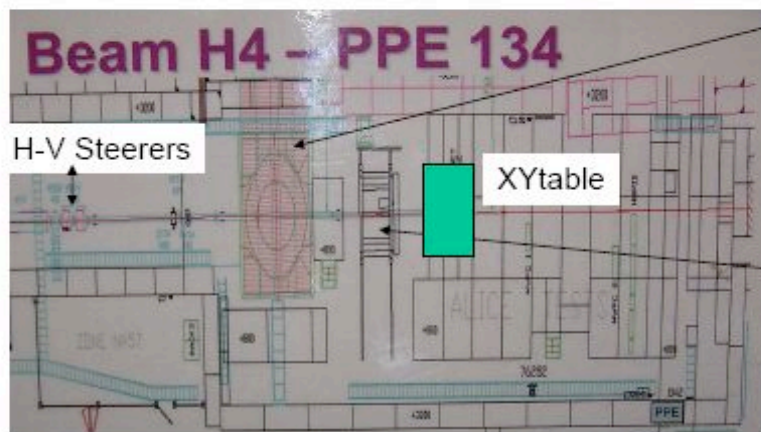- **Many interesting contributions**
  - **Check at http://glast.pi.infn.it/glastdocs/cernbeamtest/**
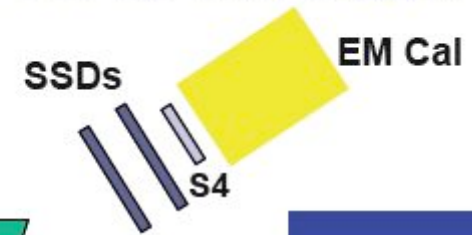
SPS Setup

- **Clean e⁻ and p beams requested at CERN – should be available all the time**
  - **Setup defined and able to tag also non-clean beams (cerenkov+TRD)**
    - **All hardware in place (detector + DAQ)**
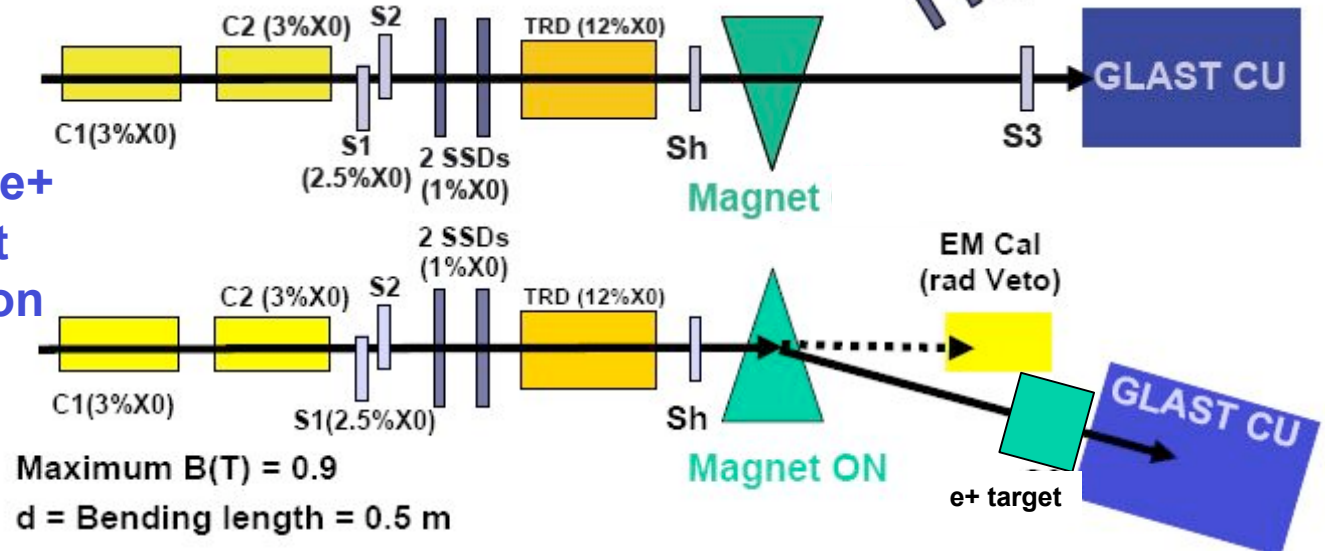   - **Detailed plan of operation in preparation (Benoit)**

PS Setup

• **magnet ON for γ**
• **magnet OFF for e-,p**

Requests for γ, e-, p, e+ : flexible PID but very limited space at T9

• **EM CAL as γ veto for e+**
• **MMS+thermal blanket target for e+ annihilation**

- **Many contributions to study performance, limitations and use of the γ-tagger**
- **γ – tagger performance report and operation plan in preparation, taking into account**
  - calibration procedure (minimize nb of configurations and set-up time)
  - tagger resolution limit (especially at low energy where CU resolution is better)
  - SSD active area and SSD mechanics dead areas (not to interfere with γ and e beams)
- **Protons: sweet spot ~10GeV (all directions)**
  - no need for TOF at lower energy (was not there yet!) but require C2 → cannot remove it to increase tagger lever arm
- **Very clean positrons beam for annihilation study: sweet spot ~<1GeV (re-entrant) → require TRD**

Ancillary Systems Status

- γ-tagger
  - baseline working at INFN-Pisa, soon to take data with CU:
    - 4 XY Si-SSD from INFN-TS readout by AD DAQ from INFN-Bari
      - current minimum dead time in 0-suppression is ~800 μs
  - upgrades: INFN-Bari is building a Si-ladder for the 4th tagger plane to increase acceptance
- TRD working at INFN-Bari, available for both PS and SPS runs
- Large set of scintillators available for trigger and veto
  - Gary/Benoit working to provide a 2mm thick plastic for triggering to limit X0 along beam
  - INFN working on support mechanics for all PMs
- Line Cerenkenkov for PID
  - Requests for gas/pressure being agreed with CERN
- Passive beam dump for photon mode with lead bricks from CERN

ACD Handling and Test
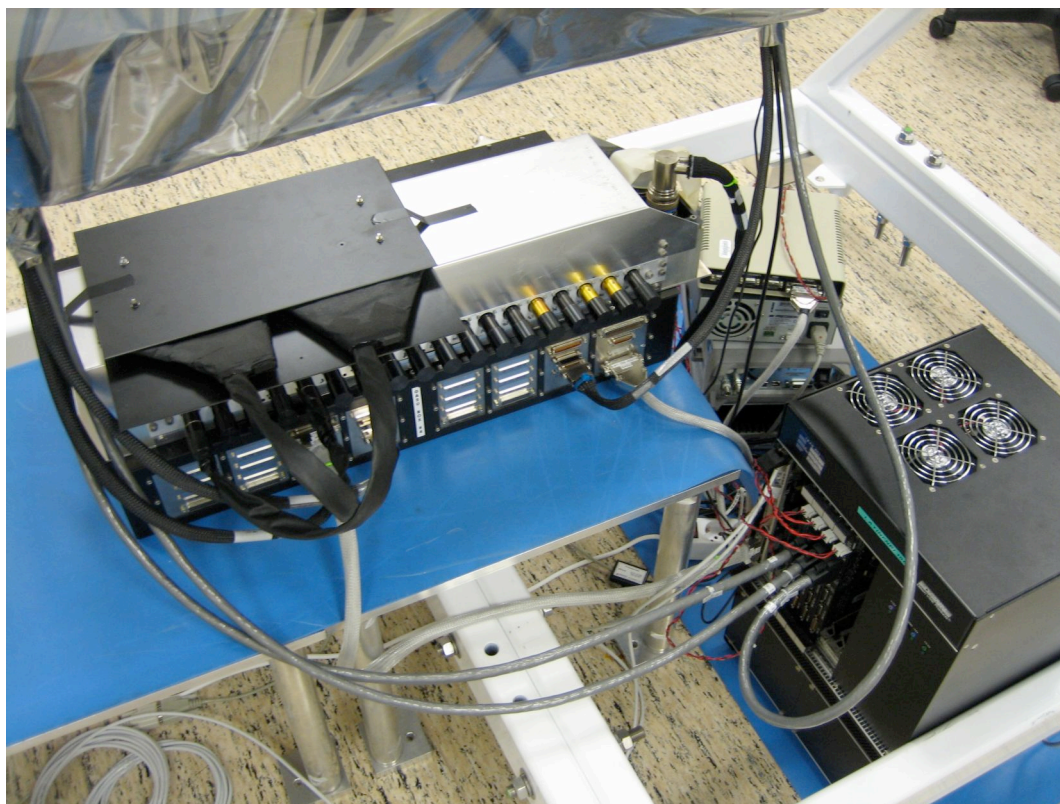
- 2 ACD tiles connected to FREE board

- successful testing (functional + light tightness) using LATTE

- last 3 tiles coming mid june

- specific request for calibration runs on the beam (Alex)

Off-line

- – **Mass production launched and ready for new production**
  - • **Operator requested**
- – **CU and AD data streams merge will happen according to plans**
  - • **LDF as a baseline – must be in place by mid june**
  - • **Root level as backup**
- – **AD digis and recon being implemented in Gleam**
- – **Calibration file for AD will be defined by INFN and supported by Joanne**
- – **BT Tuple definition in progress**
- – **Gleam offline monitor definition complete – example soon with first CU data**

MC data production

PS

Particle	Energy (GeV)	Angles (deg.)	Position*	Field (T)	Stat.
e-	2	0,40	1	1	400k
e-	10	0,40	1	0	100k
e+	1	0	1	0	100k
p+	1	0,90	1	0	100k
π+	10	0	1	0	100k
π-	10	0	1	0	100k

available since 2 weeks ago

SPS

Particle	Energy (GeV)	Angles (deg.)	Position*	Stat.
e-	20	0,40,90	1	100k
	280	0,40,90	1	20k
p+	20	0,90	1	100k
π+	20	0	1	100k

New production soon
SPS runs
π runs not needed
p at 180^0
more energies and angles
more statistics

More Highlights

- **Computing infrastructure**
  - **Baseline: 3 dedicated machine from SLAC for DAQ, database, data storage and FastCopy to SLAC**
  - **Backup: current PCs for DAQ, dedicated PC for data storage**
  - **Network architecture agreed with CERN**
- **Logistics**
  - **Pasquale discussed access to CERN, security issues, network access - instructions posted to beamlist**

Conclusions

- ## We are on schedule

- ## Much progress happening on all sides

- ## Experimental setup defined

- ## Operational plans for both PS and SPS runs being written

- ## Dedicated report on tagger in preparation

- ## Update on beam test plan in progress

- ## More focus on data analysis expected soon