



GLAST CERN BEAM TEST T9 – PS Run Status

Gamma-ray Large
Area Space
Telescope



Luca
for the beam test team





Overall status

- Restarted full-steam after forced and long stop due to PS problems
 - Tagger calibration completed on 8/9 (during last VRVS)
 - First large photon sample taken in *full-brem* at 0° on 8/9 night
- Then fight again with CERN problems ...
 - another 2 days stop for problems in the PS magnets
 - negotiated a 4th extra p extraction per PS super-cycle for our beam line with CERN
 - Critical for tagged photon runs where acceptance and synchronization with ancillary limit acquisition rate
- Restarted full-steam² on Friday 8/11 morning and stable since then
 - Trigger setup re-established real quick after Sh failure
 - Completed first extensive photon data-set
 - Positron annihilation runs taken last night
 - Proton background runs being taken now with very high statistics



Photon data

- Data taking configurations

- Full-brem

- Trigger on S_{front} only
 - Full brem spectrum from 2.5GeV e
 - Rely on nominal beam position, G4 bremsstrahlung spectrum, estimated radiator material

- Tagged photon

- Trigger on $S4 \& S_{\text{front}}$
 - Record limited slice of spectrum but provide single γ energy and incoming direction

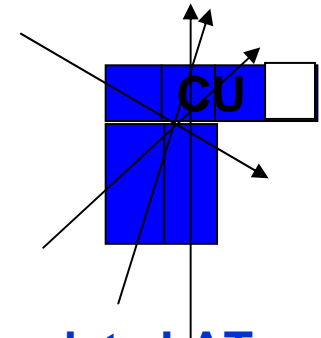
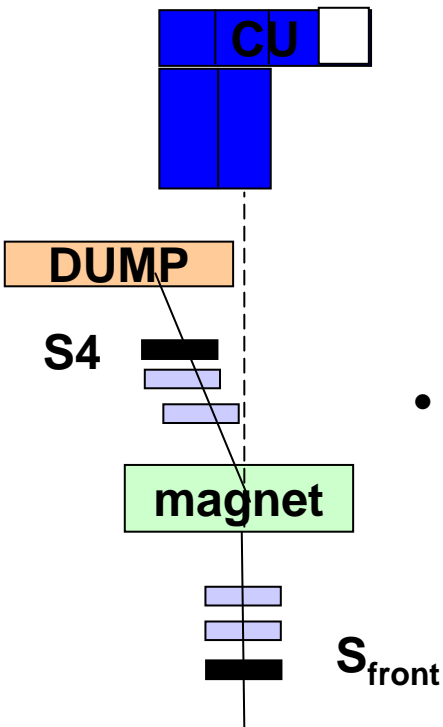
- CU positions

- 0, 30, 50 degrees

- Full-brem: 800k γ 0-2.5GeV
 - Tagged: 100K γ 0-1.5GeV

- 145 degrees (albedo)

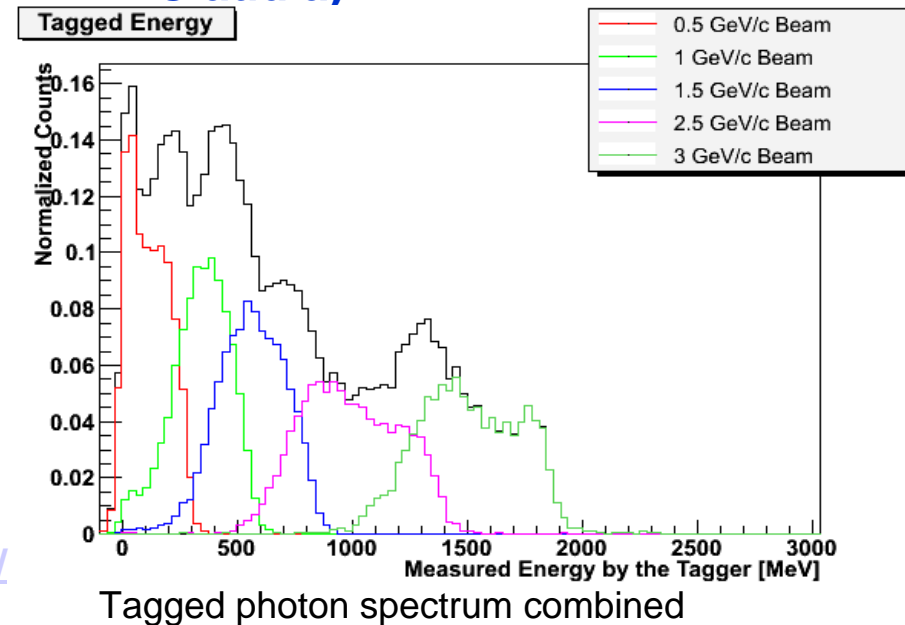
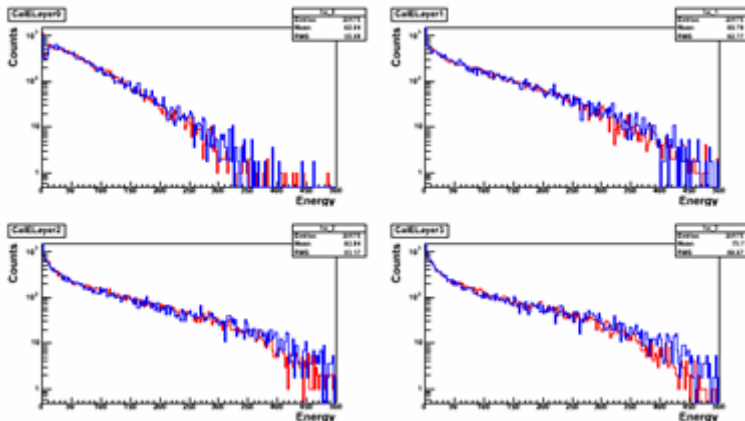
- ACD tile moved on twr 3 side to simulate LAT response to such photons
 - Full-brem: 800k γ 0-2.5GeV
 - Tagged: 100k γ 500-800MeV, 25k 100-300MeV





Photon data

- Full-brem runs - spectacular agreement with MC almost in real-time
 - congratulations to the team for good preparation in
 - Detectors, DAQ, offline recon and pipeline, MC
- Tagged photon runs
 - Performance evaluated (see Carmelo)
 - Critical for energy recon studies (see Philippe)
 - PSF studies comparison between two modes (see Claudia)



Benoit quick-look comparison with MC and others at <https://confluence.slac.stanford.edu/display/BeamTest/Daily+Schedule>

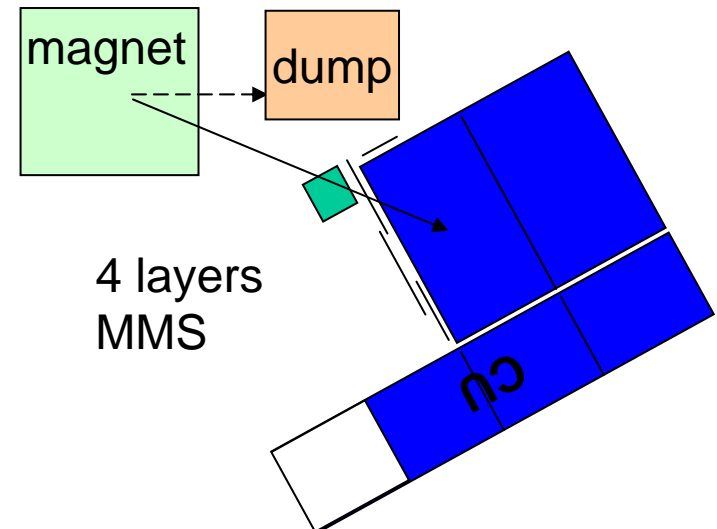


Positron runs

- first set of data with simplified setup
 - Magnet ON and extended dump to stop brem γ from e^+
 - Just shoot 1M e^+ through MMS placed in front of ACD tiles
 - Also shoot 1M e^- for comparison
 - Rely on ACD veto power
 - Require tracking to
 - Identify exact MMS target position
 - Identify ACD cracks
 - Find double photon events from annihilation

- working on the data

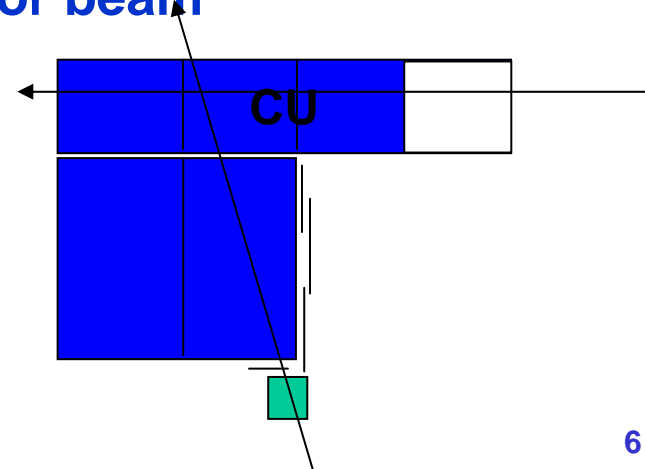
- Eric and Philippe to identify cuts
- Stefan and Francesco to run MC simulations





Proton runs

- **Collect 10M protons at 10, 6, 1 GeV**
 - Small angle and through MMS target
 - 90° for background study and hadronic interactions modeling in the CAL
 - Have to live with few % K contamination, while π are rejected by veto on cerenkov
- **Collecting data in standalone mode, external trigger**
 - LATTE peak rate over 4KHz
 - Pipeline test too
 - Running ancillary in parallel to monitor beam stability





Program

- Increase statistics for photon runs
 - Collecting desired list of configurations for specific studies
- Collect more electron runs
- Verify positron run and might repeat measurement with improved setup
- Do analysis