NA62 Large Angle photon Veto detectors

**FEE board**
- CANopen IN OUT
- 16ch IN Analog
- 16ch IN Analog
- LVDS
- Low voltage IN 48V
- Sum 4 analog ch
- Sum 10 analog ch (sum of sum)
- Connected to a 50Ω lamp output
- 32ch OUT LVDS
- 32ch OUT LVDS

**Simulation**
- Digitization simulation
- Time over threshold (ns)
- Output Data Plot
- Input in PMT
- Data MC
- G(Q)
- G(Q)
- Time over threshold (ns)
- G(Q)
- G(Q)
- G(Q)

**Performance**
- Test beam setup of the NA62 @ CERN T9 beam
- Timing resolution
- Energy and time resolution are dominated by detector performance.

**TDC & Tel62**
- TEL62 readout board
- Tel62 (based on LHCb TELL1)
- 2 FPGA-based 256KB DDR memory
- 16 TDC channels per board (4 TDCs mezzanine)
- 16 TDCs to the readout
- On board credit card PC for remote programming and control
- TTC clock reference

**TDC mezzanine board**
- Based on CERN HTPDC chip
- Up to 16 TDC channels per mezzanine board
- 16 TDC channels in 4 boards
- Up to 64 TDC channels per system (4 TDC boards)
- Normal TDC time resolution < 50 ps

**LAV in NA62 Trigger**
- Used to reduce events with photons at large angle
- Flag photons into LAV and keep random veto (<1%)
- Level-1 7 veto using the 1st LAV detector 12 stations
- Software implemented
- Level-2, implemented in software
- LAV data used in analysis

**Charge reconstruction algorithm**
- The TDC is the sum of the Ch rate and the time TDC of the signal
- Only depends on the PMT construction parameter, while the L1 veto
- Dependence on the signal arrival TDC and the time
- Constant CCH, T of charge loss in the PMT capacitance
- Calculated by measuring the charge vs. time

**FEE working principle**
- From analog signal to ToT
- Split the input signal in two copies
- Lead to the ToT
- Measure the time using a TDC (during data taking)
- Charge reconstruction algorithm
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**Test beam setup of the ANTI-A2 @ CERN T9 beam**
- π0 → 2γ
- Very sensitive to physics beyond the SM
- Theoretical SM BR
- Decay Short dist. Test. BR. Exp. BR
- Ratio 1.35σ 1.7σ ± 1.1σ ± 0.9σ
- 4-5 rings per station (>20 X0)
- Designed to reject it from K→μνν decay with 1σ sensitivity
- NA62 detector search for K→μνν decay

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