

The RICH detector of the NA62 experiment at CERN

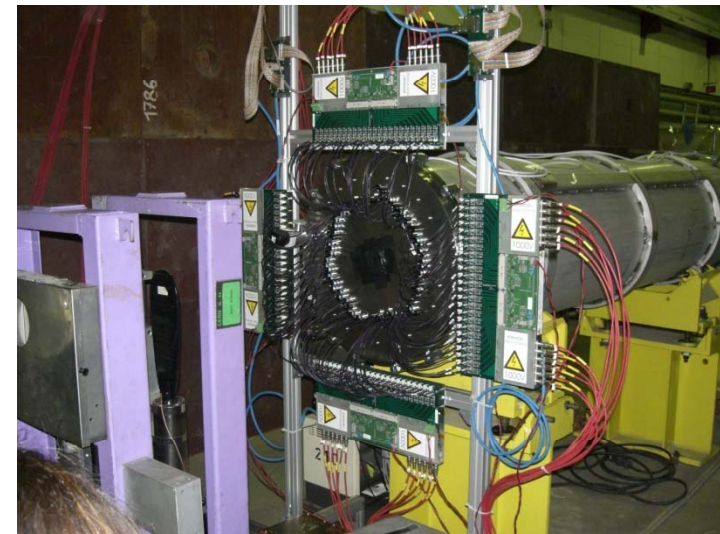
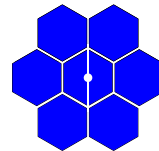
INFN Firenze, INFN Perugia, CERN

Requirements

- Separate $\pi-\mu$ at 5×10^{-3} for $15 \text{ GeV} < p < 35 \text{ GeV}$
- Measure track time at 100 ps (to avoid pile-up with the Gigatracker)
- Main charged **Trigger**

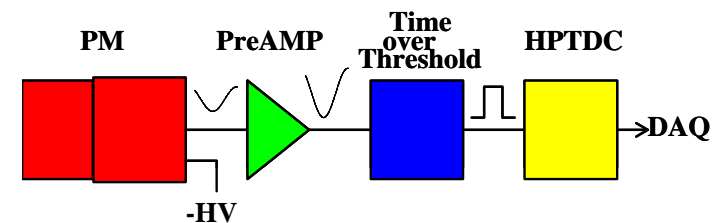
Detector

- Neon Gas at atmospheric pressure
- Vessel: 17 m long, 3 m diameter
- 2 spots of ~ 1000 PMT (hex packing 18 mm side)
- Mosaic of hexagonal mirrors (MARCON company, Italy):
 - 17 m Focal Length
 - 1 m diameter, 2.5 cm thick glass
 - Aluminum deposit with MgF_2 coat
 - piezo actuators for alignment



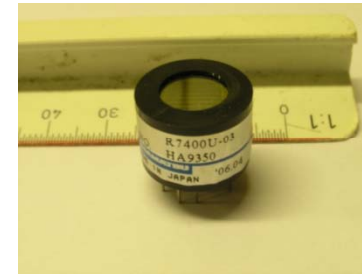
Electronics

- NINO ASIC as fast Time Over Threshold discriminator
- HPTDC with 100 ps LSB
 - TELL1 board (LHCb) final
 - CAEN V1190 (128ch) for test beam



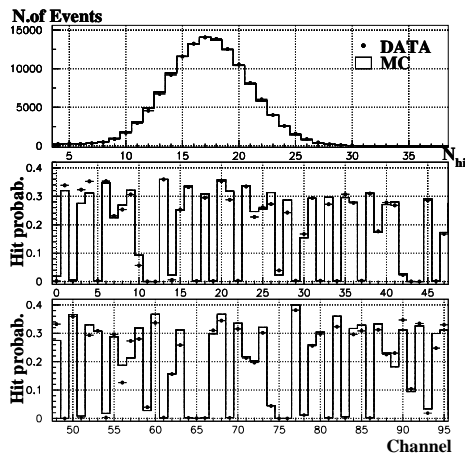
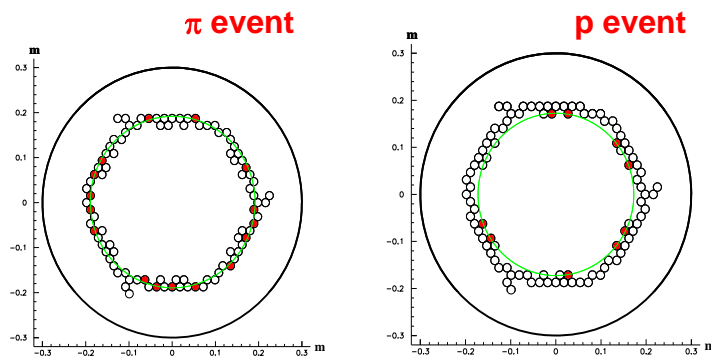
The light detection

- Hamamatsu R7400 U03 Metal package phototube
 - 16 mm diameter, 8 mm active diameter, 8 dynodes
 - 185 nm – 650 nm, 420 nm peak sensitivity
 - UV glass window, Bi-alkali cathode
 - Gain 7×10^5 (typ.), transit time 5.4 ns, transit time spread 0.28 ns
- Winston Cones covered with Mylar
- 1 mm thick quartz window

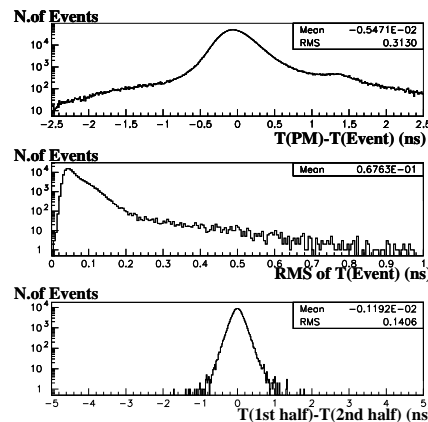


TEST BEAM RESULTS (NIM A 593 (2008), 314)

- $N_{\text{Hits}} \approx 17$
- $\Delta t_{\text{Event}} \approx 70$ ps
- $\Delta \theta_c \approx 50$ μrad



$N_{\text{Hits}} \approx 17$



$\Delta t_{\text{Event}} \approx 70$ ps

