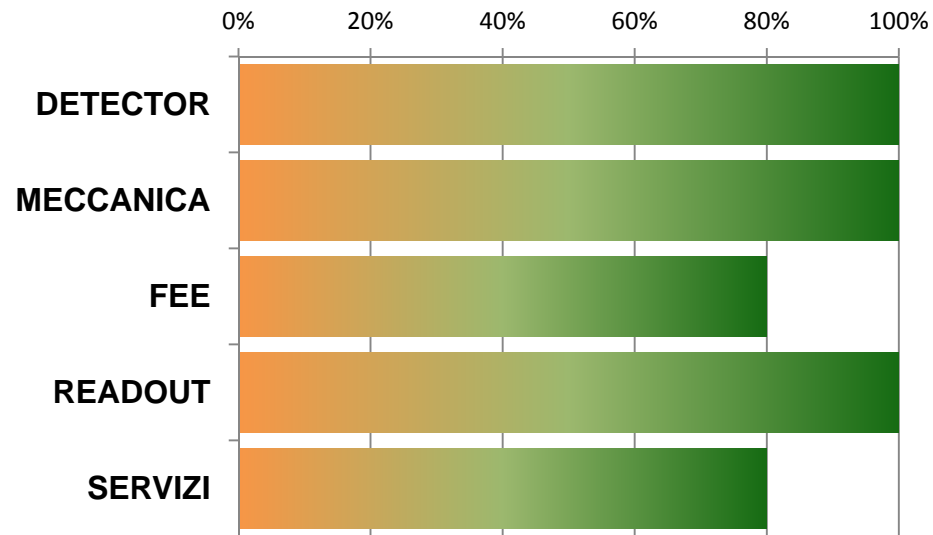


# Mwpc status report

Giugno 2013

*Le camere sono “condizionate” da circa un anno (aria secca, HV, terminazioni a massa).*

*Comportamento buono, ma sensibili a temperatura/umidità dell’ambiente.*



# Mwpc status report

Giugno 2013

*Detector (Pavia)*



# Mwpc status report

Giugno 2013

*Meccanica (Tor Vergata e Pavia)*





# Mwpc status report

Giugno 2013

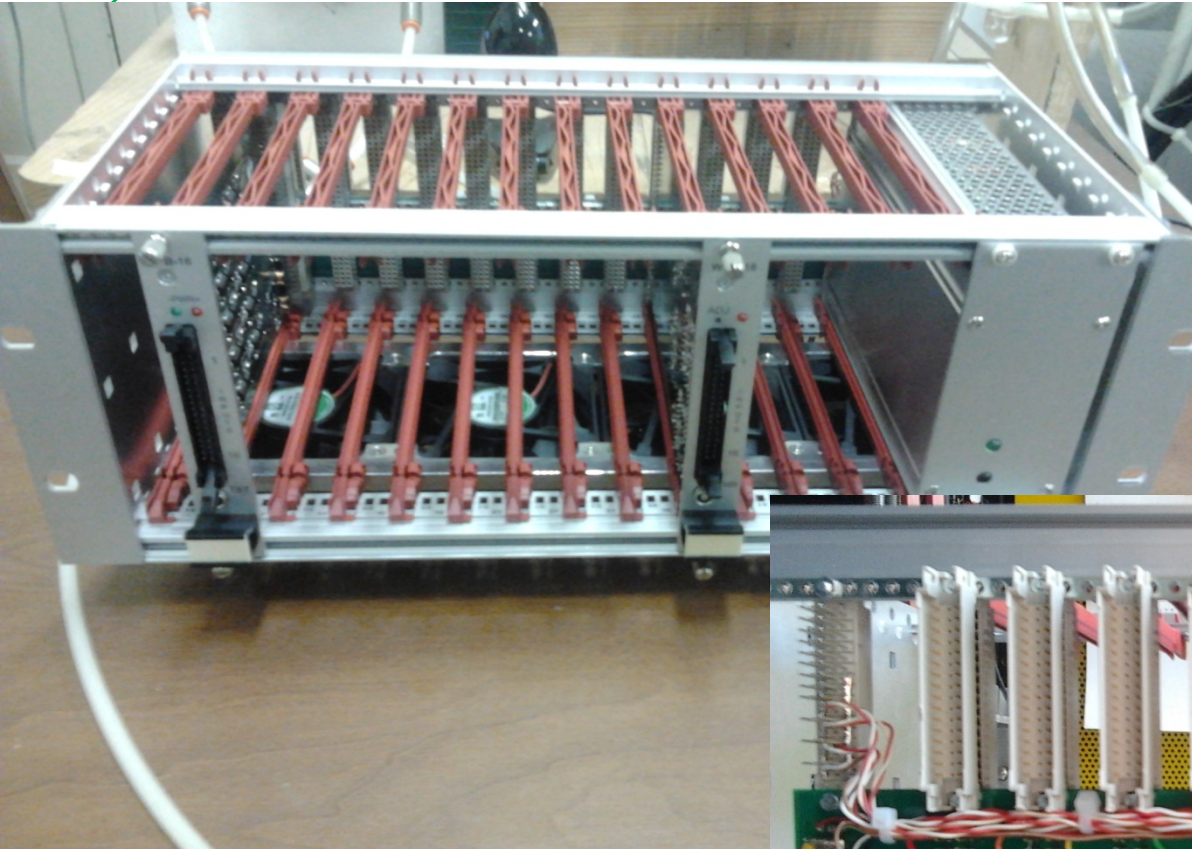
## Front End Electronics

- ✓ *Crate preamplificatori: ultimati. 4 chassis VME 3U standard con backplane custom per distribuzione power supply e output segnali analogici. 2 crate per le strips (catodo) e 2 crate per i fili (anodo)*
- ✓ *Moduli alimentazione: ultimati. Modulo custom nell'ultima slot di ciascun crate. 2 linee: +5V/8A e -5V/8A*
- ✓ *Cavi camere → preamplificatori: 80%*
- ✓ *Preamplificatori (gruppo russo...). Preamplificatori custom. Schede a 16 canali. Per le strips output differenziale, per i fili output LVDS. Prototipo finale testato apr 2012. In attesa della produzione. Consegna prevista luglio 2013.*

# Mwpc status report

Giugno 2013

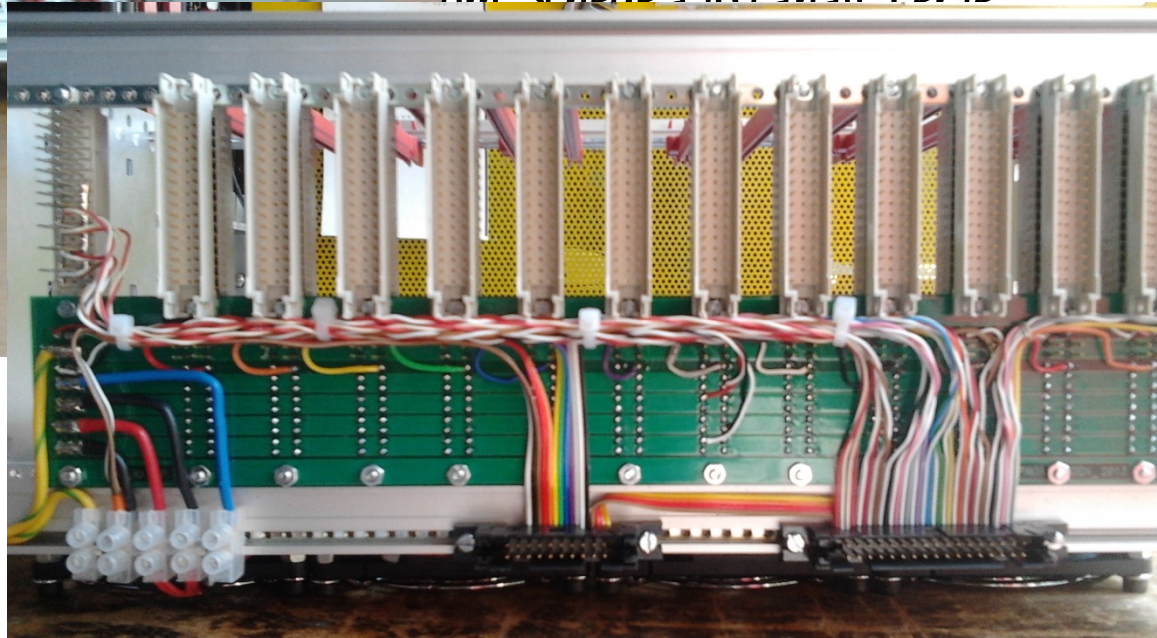
## Front End Electronics



Standard con backplane custom per crate per le strips (catodo) e 2

prima slot di ciascun crate. 2 linee:

om Scheda a 16 canali Per lo



# Mwpc status report

Giugno 2013

## Readout

- ✓ Cavi preamplificatori → readout: da intestare. Lunghezza 12 m.
- ✓ Strips: 17 SADC Wiener (272 canali): acquisiti
- ✓ interfaccia SADC: in progress. Output Pre= differenziale. Input SADC=unipolare neg.  
Progettata interfaccia di conversione. Modulo VME 1 slot /16 canali da affiancare a ciascun ADC
- ✓ Fili: 5 moduli Pattern Unit ELB (416 ch): acquisiti

# Mwpc status report

Giugno 2013

## Servizi

- ✓ Gas mixer: acquisito
- ✓ Alcool tank: in progress. Esperienza di Mainz. Miscela alcolica al 4% per alti rate.
- ✓ HV: acquisito 1 modulo NIM a 2 canali (Caen)
- ✓ Slow controls: in progress. Monitor HV, Monitor gas mixer, monitor temperature preamplificatori. Gli slow controls attuali sono implementati su software LabView e OS Windows. *Occorrerebbe armonizzarli con il sistema generale.*

## D.A.Q.

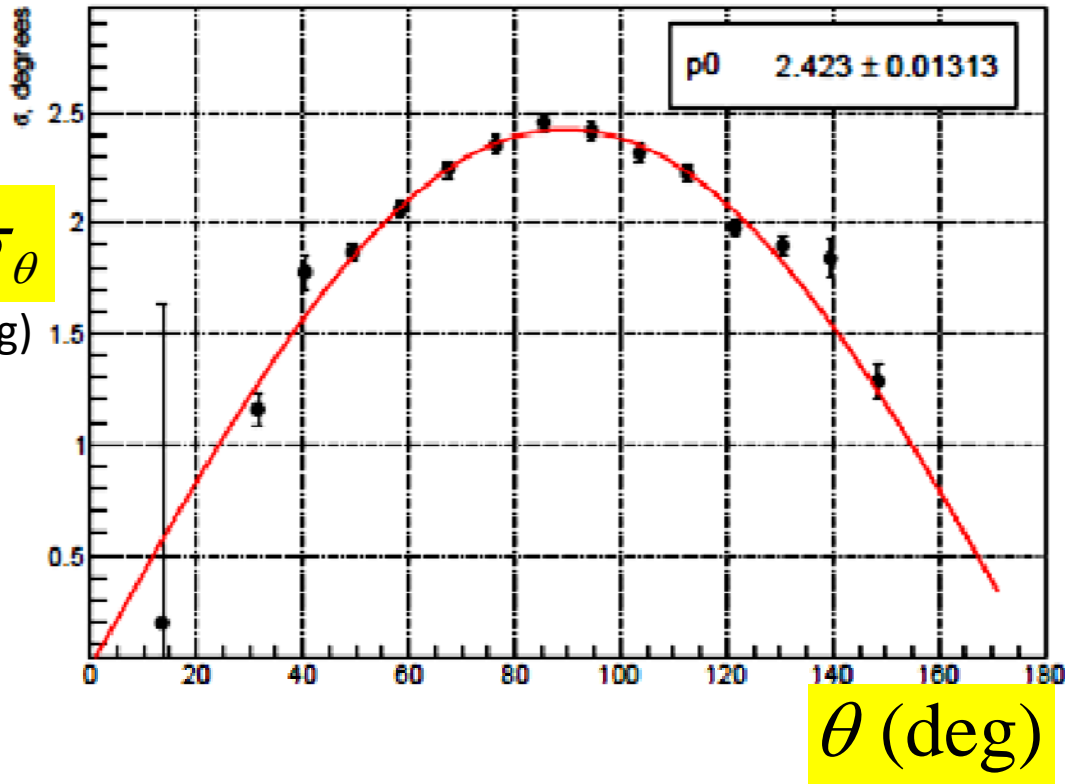
- ✓ Romaz-Bonn

## Istallazione

NON PRIMA DI AVER RICEVUTO E TESTATO I PREAMPLIFICATORI

# MWPCs angular resolution- I

Standard deviation of  $\Delta\theta$  as a function of  $\theta$



Cosmic ray events

- 4 MWPCs Intersection Points
- 2 different 2-Point Trajectories
- 2 different evaluations of  $\theta$
- Resolution = width of the distribution

$$\sigma_\theta = \frac{(\theta_1 - \theta_2)}{\sqrt{2}}$$

$$\sigma_\theta = p_0 \cdot \sin(\theta)$$

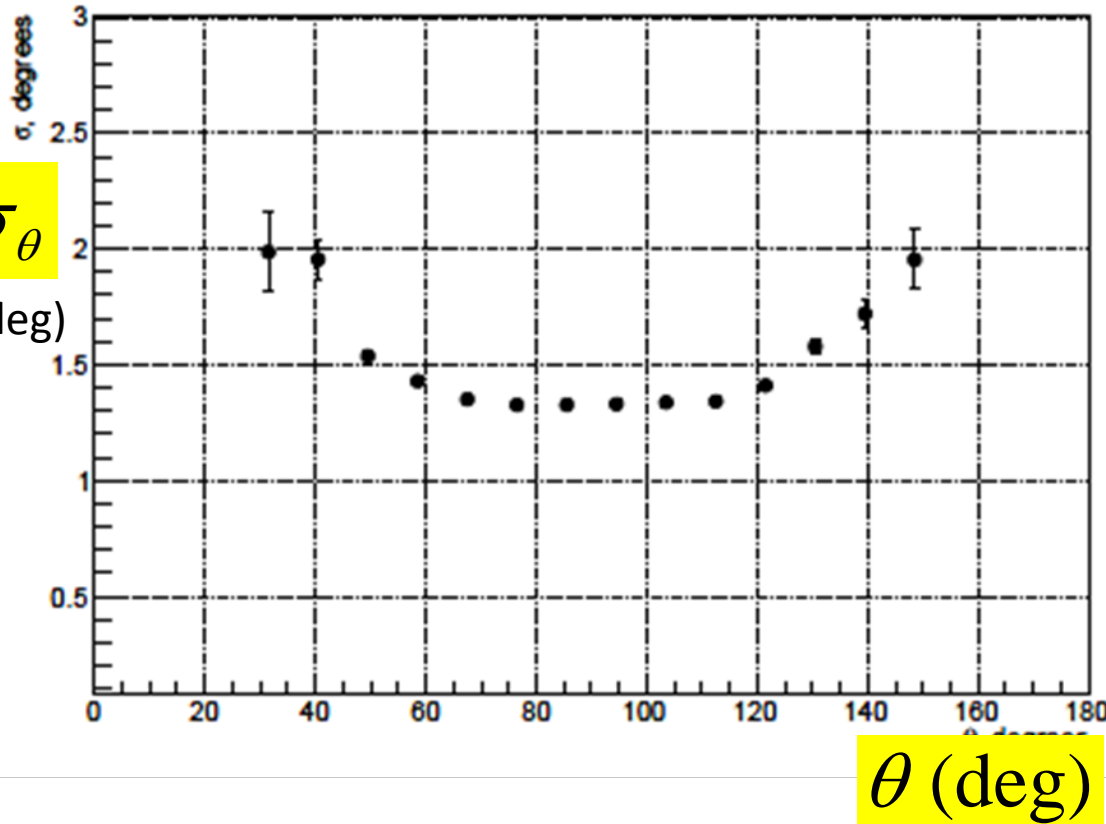
Resolution is inversely proportional to the distance between the 2 MWPCs points [=  $2/\sin(\theta)$  cm]

$$0.8 \text{ (deg)} \leq \sigma_\theta \leq 2.4 \text{ (deg)}$$



# MWPCs angular resolution- II

Standard deviation of  $\Delta\theta$  as a function  $\theta$ , MWPC-1



## Cosmic ray events

- Only 2 MWPCs Intersection Points
- 2 different Trajectories: each trajectory evaluated using 1 MWPC point + 1 point using CB cluster center of gravity
- 2 different evaluations of  $\theta$
- Resolution = width of the distribution

$$\sigma_\theta = \frac{(\theta_1 - \theta_2)}{\sqrt{2}}$$

Position resolution of MWPCs Cluster < mm  
 Position resolution of CB cluster  $\approx$  cm  
 Long distance among these 2 points ( $\approx$  30 cm)  
 Distance between 2 MWPCs points: 2-5 cm

$$1.3 \text{ (deg)} \leq \sigma_\theta \leq 2.0 \text{ (deg)}$$

CB cluster resolution  $\sim 1/\sin(\theta)$

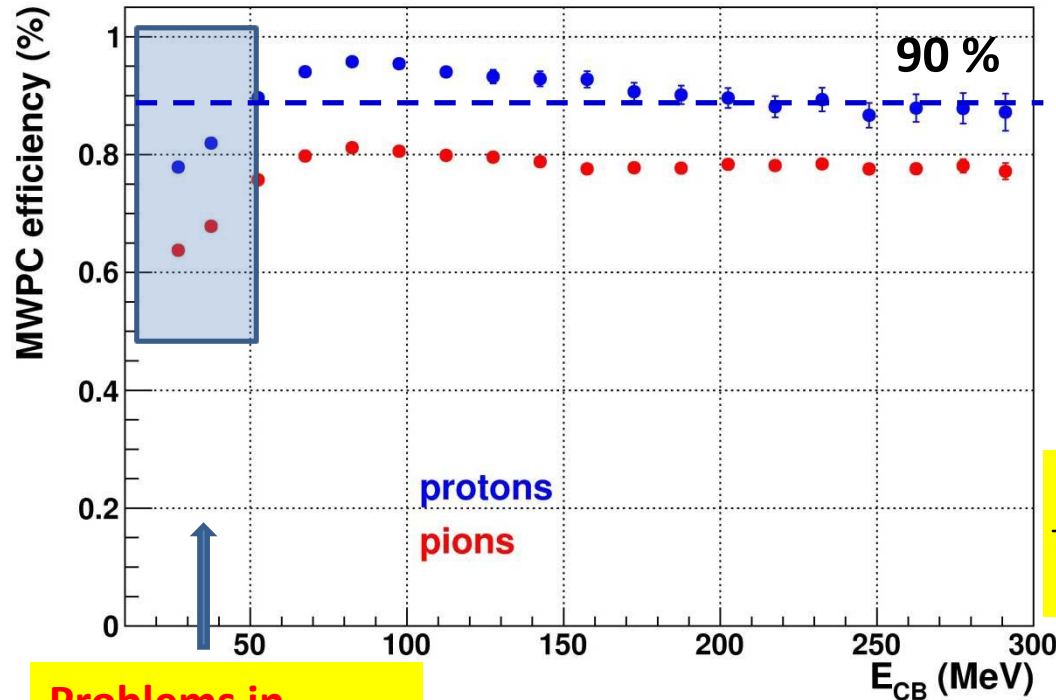
# MWPCs Efficiency

Beam dec. 2012

Experimental determination  
of the tracking efficiency  
(S.Costanza )

- $dE/dx - E$  plots using only  
PID and CB info
- (rough) proton/pion  
separation
- efficiency =

$$\frac{\text{prot(pion) events with MWPC(s)}}{\text{all prot(pion) events}}$$



Problems in  
Particle ID

mwpc-1 2425 V  
mwpc-2 2525 V

**$\geq 90\%$  efficiency for protons**

CB always gives 1 point