New data taking analysis

- Runs: 3500 6699
- Production: v 6.01
- > Tasks:
 - Data analysis
 - \diamond General study of $\mu^{\scriptscriptstyle +}$ spectra and MC simulations of multiple scattering effects with He/Air inside He chamber (Filippi)
 - Study of µ⁺ spectra by roads (Bonomi)
 - Study of Bhabha events (Filippi)
 - Study of K⁰_S signal (De Mori)
 - Study of proton spectra (Bufalino)
 - Study of π⁻ spectra (Benussi)
 - Study of π^+ spectra (Dalena)
 - Study of Λ invariant mass spectra (Fujioka)
 - Calibrations
 - LMDs calibrations: Botta
 - TOF calibrations: Dalena, SImonetti
 - STRAWs calibrations: Benussi, Gianotti
 - Si DET calibrations: Piano
 - Alignments
 - First vertex alignments (Piano)
 - Analysis of straight cosmic rays (De Mori)

µ⁺ momentum per target: general trends - MEAN VALUE



Decreasing trend with time

Stronger disalignment effect: Tgt 4 Tgt 5 Tgt 6



µ⁺ momentum per target: general trends - RESOLUTION



No particular trend with time

Resolutions spanning within a 30% max range

µ⁺ momentum per target: MC simulation - resolutions



Decreasing trend with increasing amount of He inside the chamber Worsening of 0.08% going from 100% to 30% of He: expected worsening of 0.1% going to 20% of He

No cuts, fw+bckw tracks

Effect of reconstruction with wrong He-air mixture: Systematic lower values for mean and resolution: @70% He 30% air, reconstructed as 100% He: _0.1 MeV/c for momentum _0.005% resolution

Study of Bhabha events: full detector





As in previous data taking: •Electrons •two peaks, higher mean momentum, larger sigma •Positrons •one peak only, lower mean momentum, narrower peak

•Difference between mean values: 5 MeV/c

•No evident drift with time

Study of Bhabha events, upper and lower halves - MEAN value



Electrons: difference of about 6 MeV/c between upper half and lower half Positrons: difference of less than 2 MeV/c

Study of Bhabha events, upper and lower halves - sigma value



Electrons: narrower distributions for lower half arms, both narrower than the cumulative value (two peak position drifting with time) Positrons: narrower distributions for upper half arms, larger – less resolution- for lower half ones

Study of Bhabha events, left/right effects - MEAN value



Electrons: right half larger value, left half lower value (7 MeV/c) Positrons: right half larger value, left half lower value (3 MeV/c) Asymmetric: larger difference from nominal value on the right side

Study of Bhabha events, left/right effects - sigma values



Electrons: left half narrower distribution Positrons: right half narrower distribution

Bhabha runs, up/down/left/right summary



100 runs beginning of data taking (mixed)

2 peaks for e⁻ in the upper half

Right half e⁻ moved right, left half moved left (upper half: superimposition?)

Bhabha runs, up/down/left/right summary



100 runs around run6200 (after Hechamber breakdowndedicated trigger)

1st peak for e⁻ in the upper half smoothed

Right half e⁻ moved right, left half moved left

Summary from Bhabha observations

- Two peaks for electrons, one for positrons
 - More centered and narrower distributions for positrons
- Electrons:
 - Up/down: 6 MeV/c difference between peak positions
 - Upper half with two peaks
 - A drift effect with time (not connected with alignment) seems to be present
 - Left/right: 10 MeV/c difference between peak positions
 - Asymmetry: more marked discrepancy for the right half

LMDs calibrations (E. Botta): small chambers T0



- All wires small chambers
- Difference between T0 in each run (up to run 6730) and DB T0
- x scale: 1 ns/ch
 - 4 wires with problems, can be rejected in the reconstruction phase (noise)
 - 1 wire only with sizeable offset (can be corrected with a proper table)

LMDs calibrations (E. Botta): large chambers TOs



- All wires large chambers
- Difference between T0 in each run (up to run 6730) and DB T0
- x scale: 1 ns/ch