Tracking in KLOE

Sergio Bertolucci University of Bologna and INFN

The KLOE tracker requirements

- High and uniform reconstruction efficiency over a large volume, in order to cope with the long decay path of the KL and the isotropic distribution of its decay products;
- Good momentum resolution $(\Delta p_{\perp}/p_{\perp} \sim .4\%)$ for low momentum tracks (50 < p < 300 MeV), in order to successfully reject the Kµ3 background.
- Transparent to low energy photons (down to 20 MeV). The K_L into K_S regeneration on the internal walls must be minimized too.

The KLOE tracker

- Almost square cells (12 layers 2x2 cm², 46 layers 3x3 cm²) with alternating and varying stereo angles (±60 to ±150 mrad), cathode/anode ratio 3:1
- Al (Ag) 80 μm field wires, W(A) 25 μm signal wires, 52140 wires in total
- Tensionable CF endplates ($\leq .1 X_0$)
- 90% He + 10% C_4H_{10} mixture, $X_0 > 900$ m (nevertheless momentum resolution dominated by multiple scattering)

The KLOE tracking system



Drift chamber $(4 \text{ m} \varnothing \times 3.3 \text{ m})$ 90% helium 10% isobutane 12582/52140 sense/total wires

Superconducting coil (5 m bore) $B = 0.6 \text{ T} (\int B \, dl = 2.2 \text{ T} \cdot \text{m})$



Space resolution



3x3 cells

2x2 Cells





Momentum resolution



Reconstructed quantities



K_s momentum

K_s Mass

A different tracker in the KLOE magnet?



Figure 1: Schematic view of the KLOE detector

THANK YOU