AMS General Meeting
Testbeam 11/99 Results

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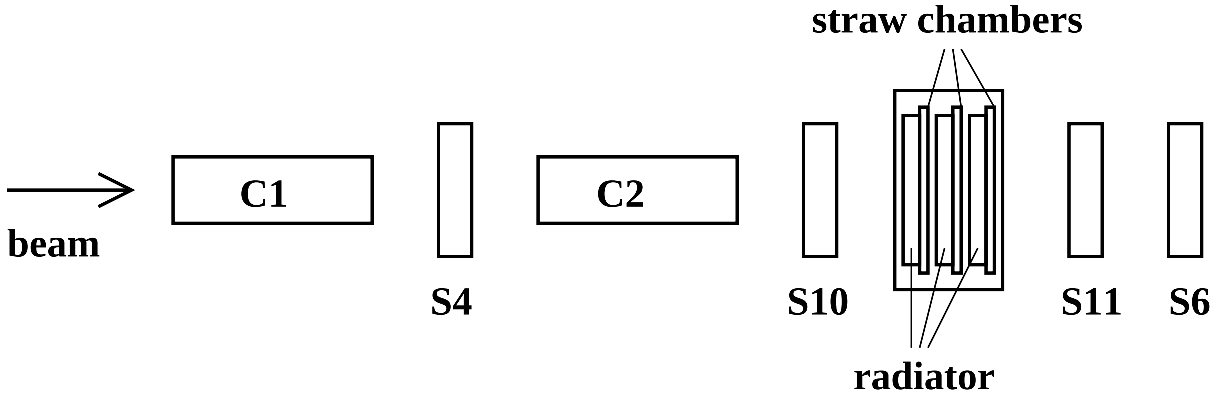
RWTH Physics AC-I

Testbeam Setup

PS-Beamline T9, East Area
Beam-energy:
$\pm$ 3.5 GeV, $\pm$ 5.0 GeV, + 10 GeV, + 15 GeV



Trigger:

- e^-,e^+ : $\mathrm{S4} \wedge \mathrm{S6} \wedge \mathrm{S10} \wedge \mathrm{S11} \wedge \mathrm{C1} \wedge \mathrm{C2}$
  C1 & C2 at p=0.6 bar
- p^+ : $\mathrm{S4} \wedge \mathrm{S6} \wedge \mathrm{S10} \wedge \mathrm{S11} \wedge \overline{(\mathrm{C1} \vee \mathrm{C2})}$
  C1 & C2 at p=2.5 bar

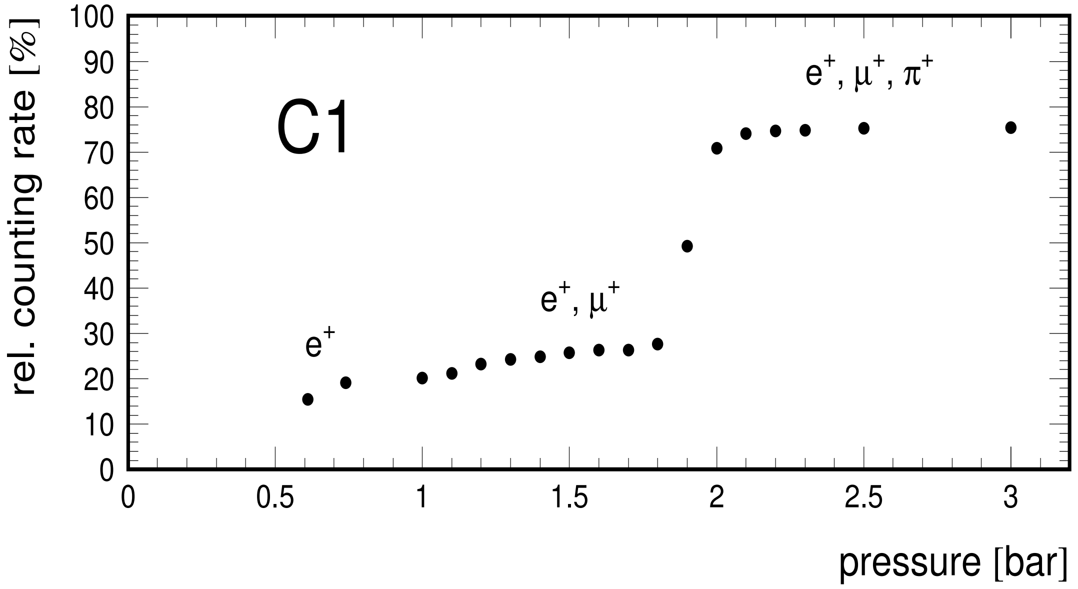
Scintillation counter geometry:

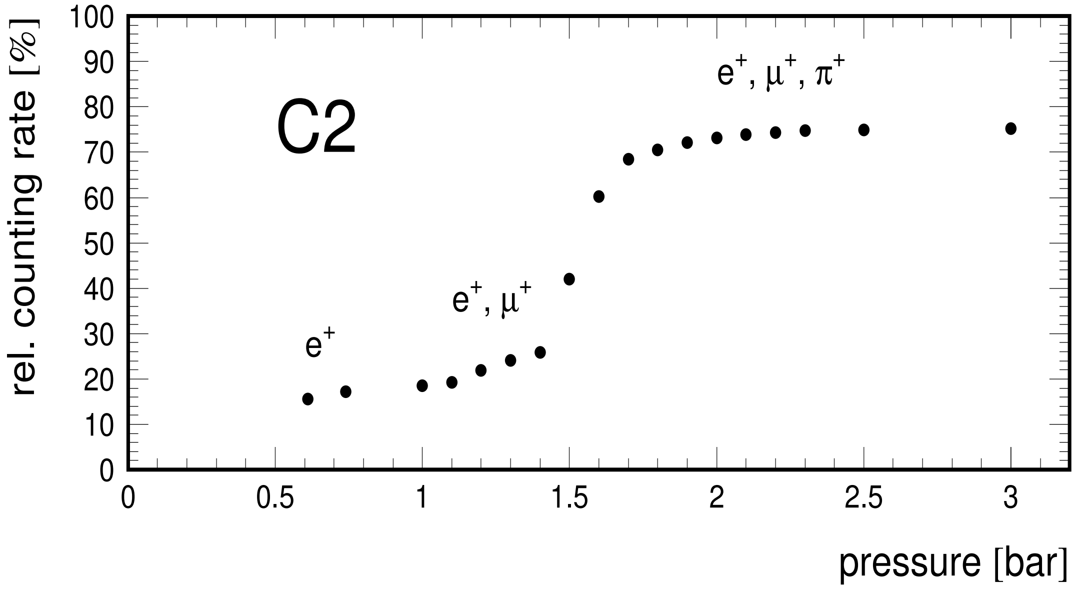
- S10a : 10×10×1 cm^3
- S10b : 5×5×0.5 cm^3
- S11 : 10×40×1 cm^3

Testbeam Setup

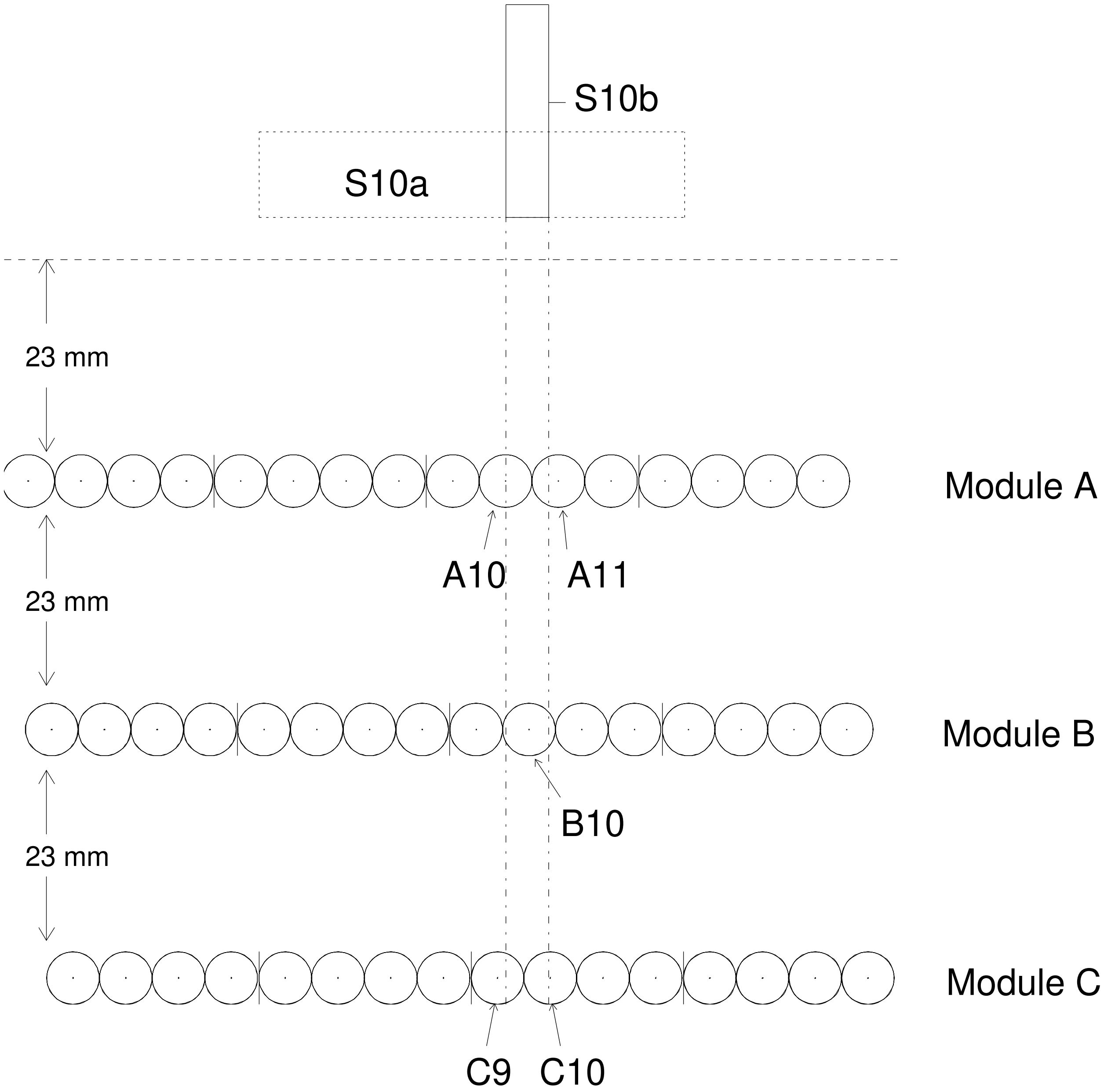
Cherenkov Counters

pressure curve, positive beam, 3.5 GeV





Testbeam Jig



Testbeam Setup

Radiators:

1) AIREX 82.80 foam
   supplier: AluSuisse

2) C1900/034 vlies (used by HERA-B)
   fiber thickness 16 μm

3) LRP 375 BK vlies (used by ATLAS)
   fiber thickness 10 μm

   – chemical composition: 85% Polypropylene
     15% Polyethylene

   – density: 0.06 $\frac{\mathrm{g}}{\mathrm{cm}^3}$

   2) + 3) manufacturer: Freudenberg Vliesstoffe KG
   69465 Weinheim, Germany

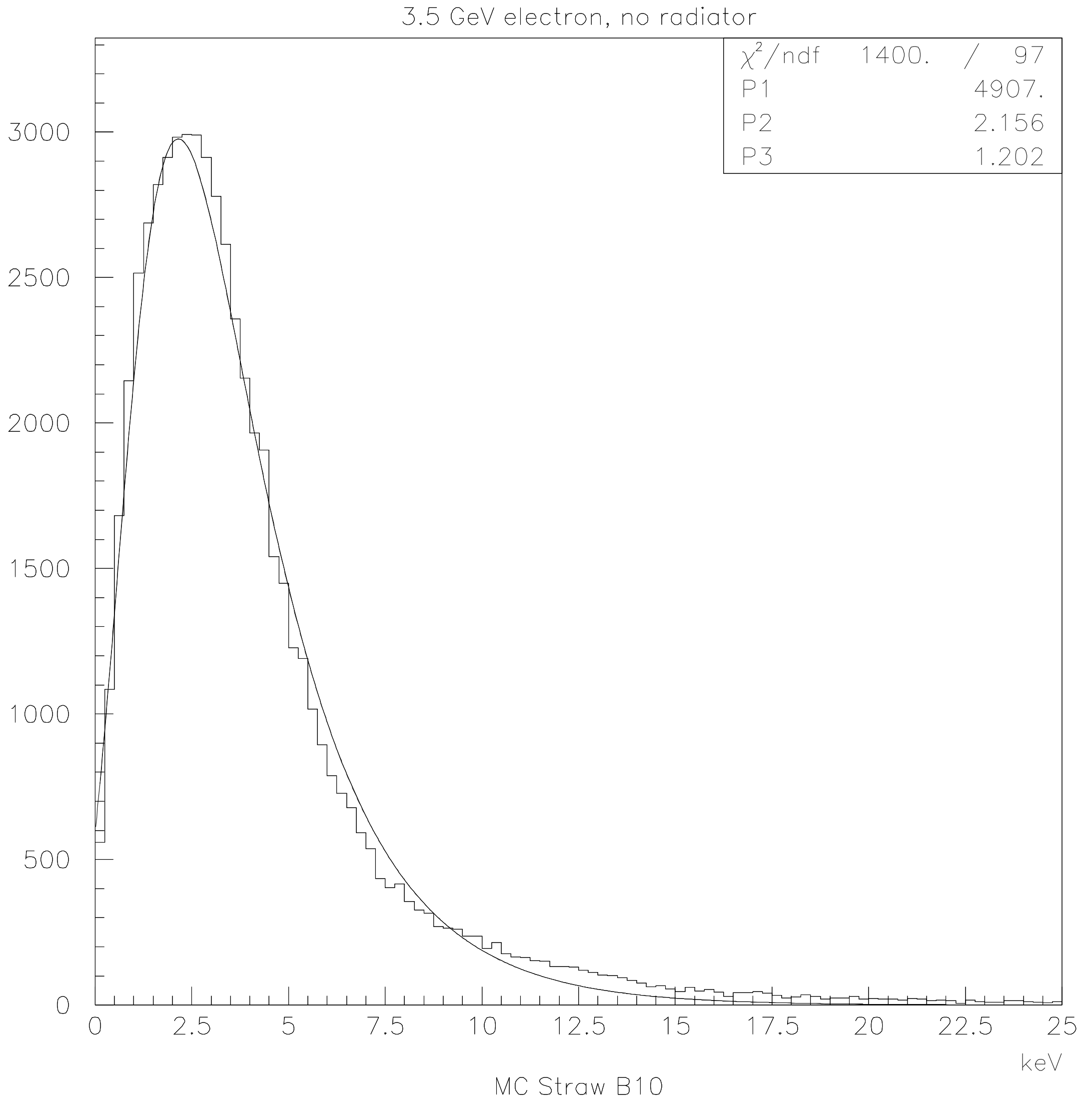
Results of Measurements

- Electrons at 3.5 and 5.0 GeV
  - without radiator
  - with HERA-B radiator (Vlies)
  - with LRP375 BK radiator (Vlies, used by ATLAS)
  - with AIREX (foam)
- Protons at 3.5, 10.0 and 15.0 GeV
  - without radiator

Testbeam Calibration

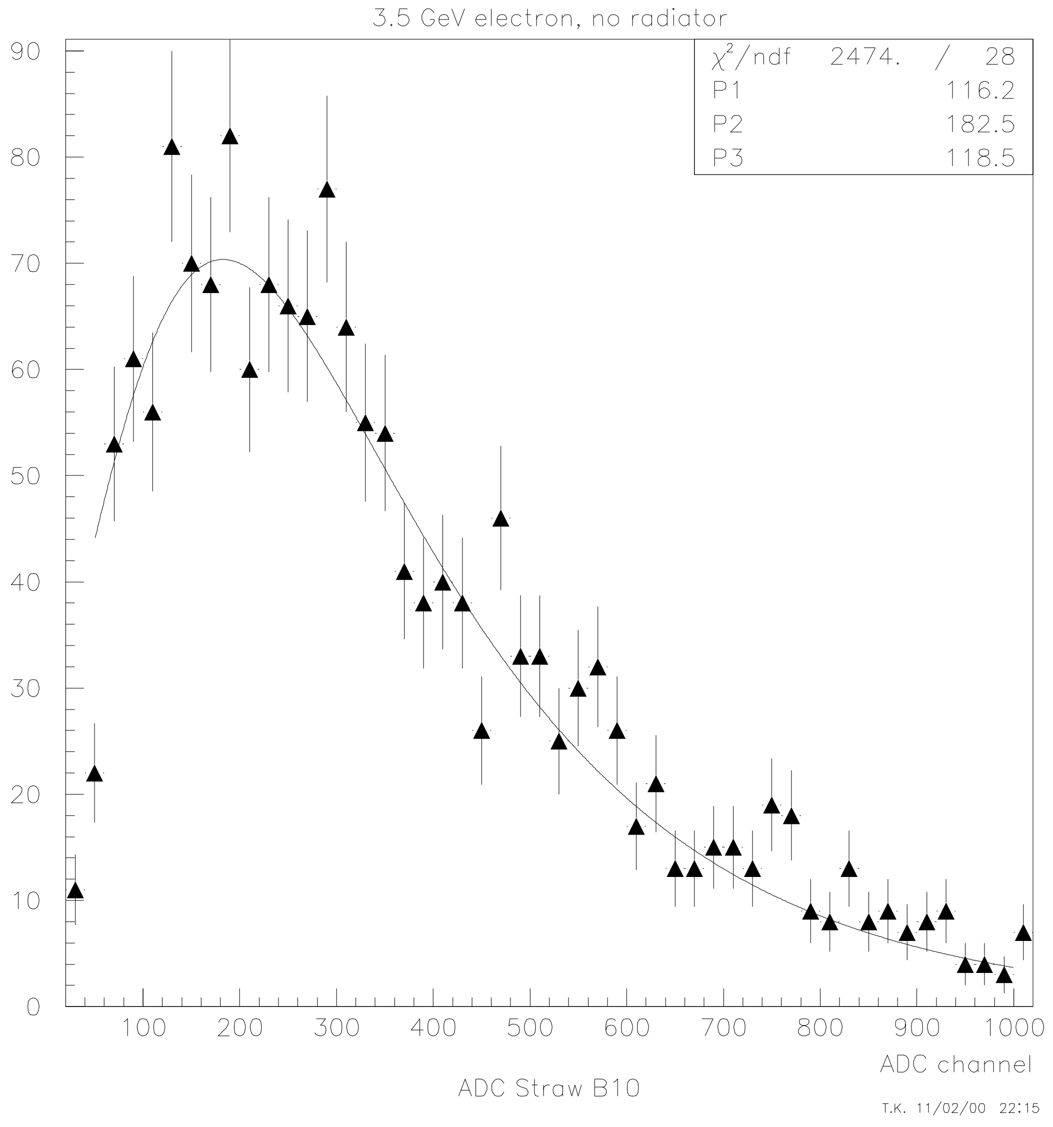
Straw B10, no radiator, electrons at 3.5 GeV, S10a
Comparison of MOP-value GEANT and DATA

GEANT



Testbeam Calibration

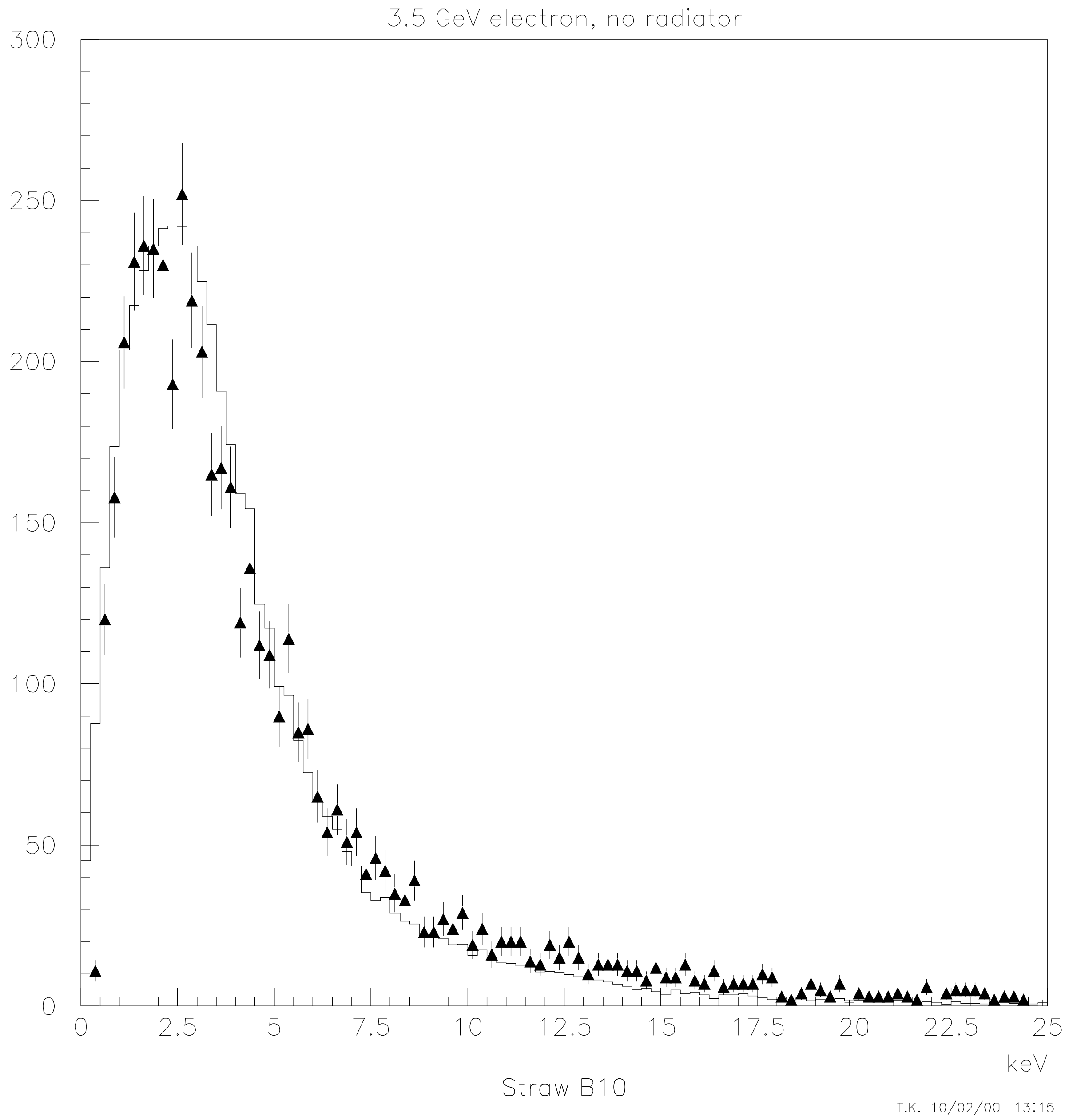
DATA



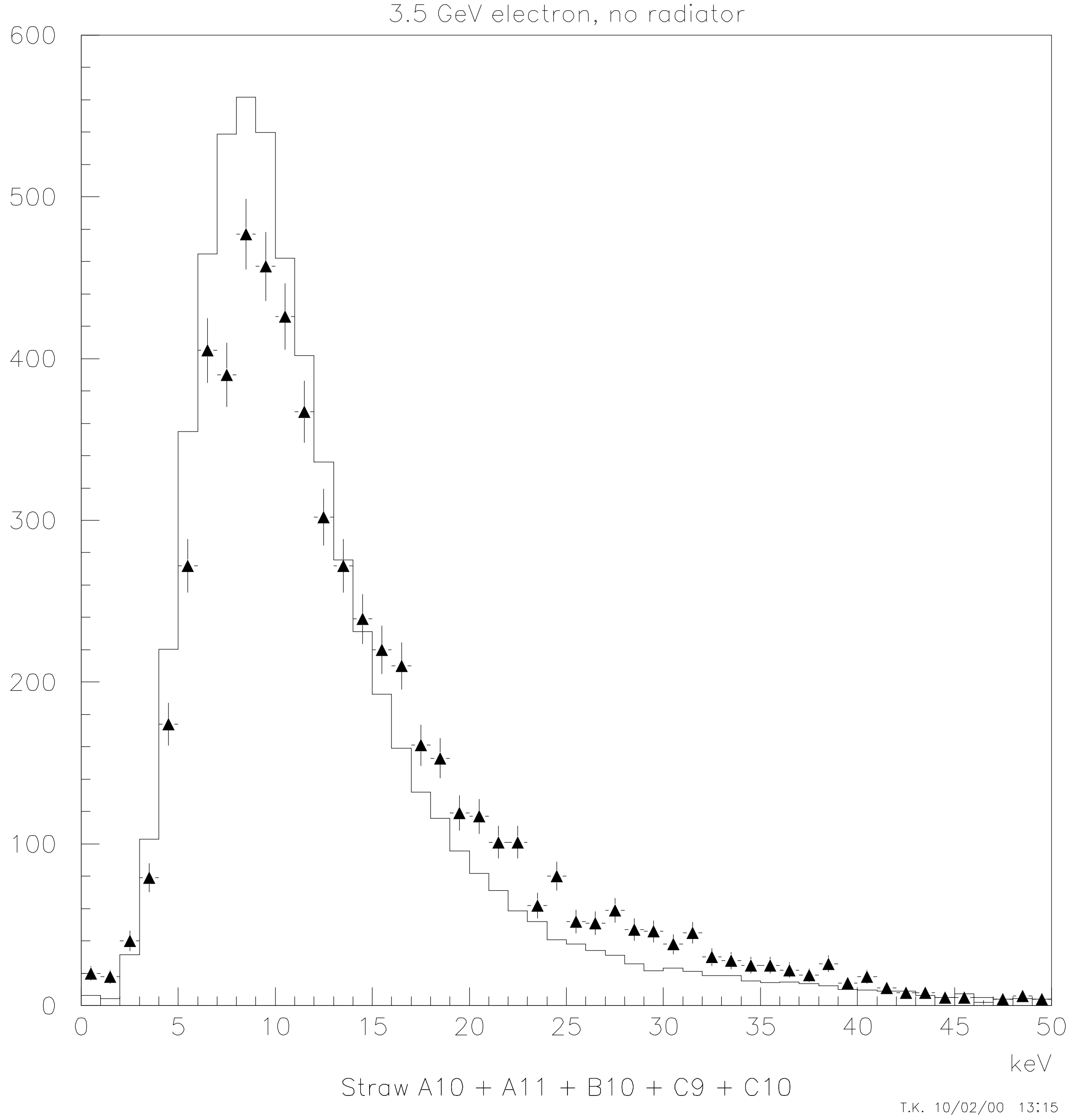
$$\rightarrow C_{B10} = 11.8 \cdot 10^{-3} \frac{\text{keV}}{\text{ADC channel}}$$

DATA intercalibrated to B10

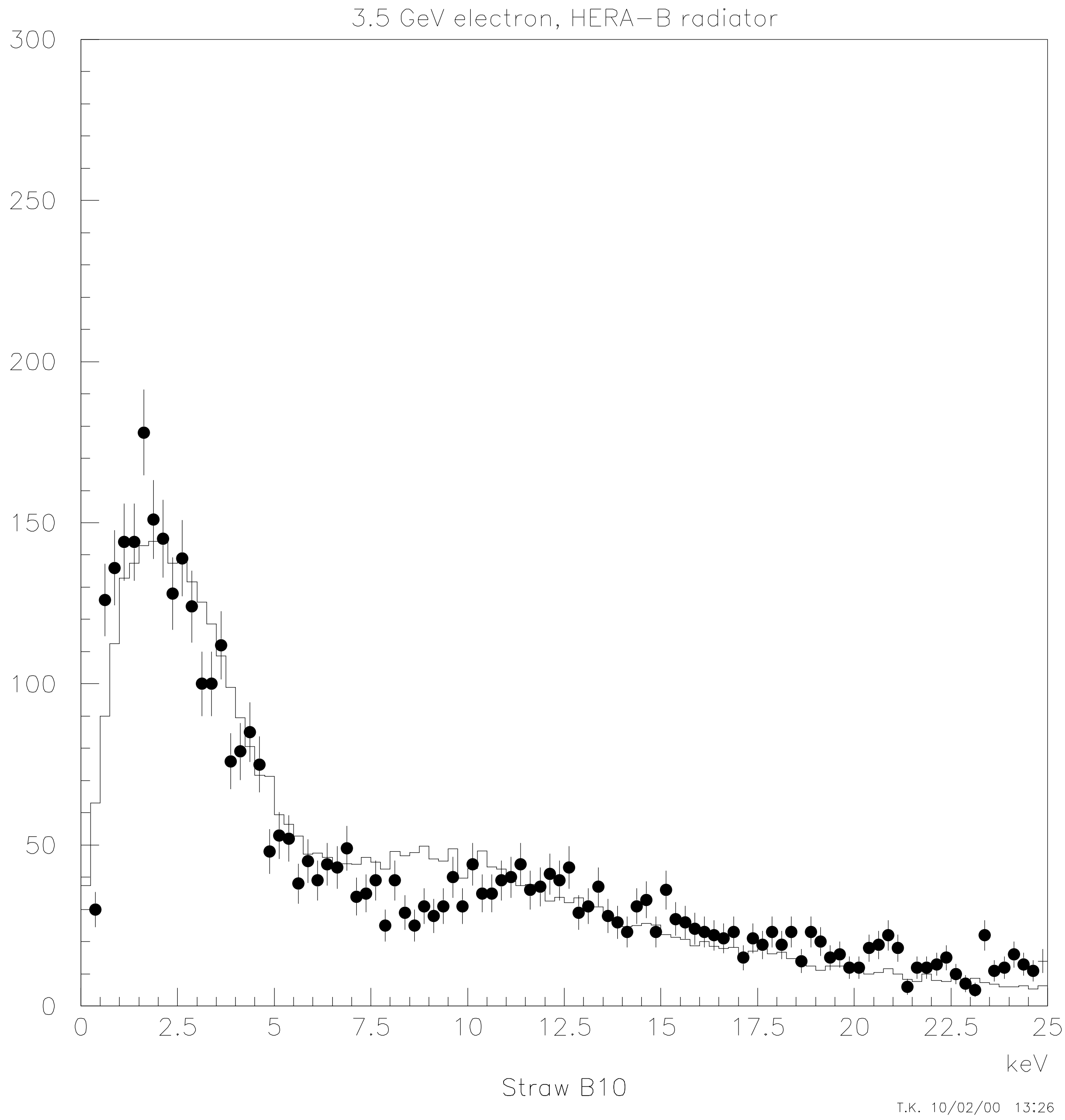
Testbeam Measurements



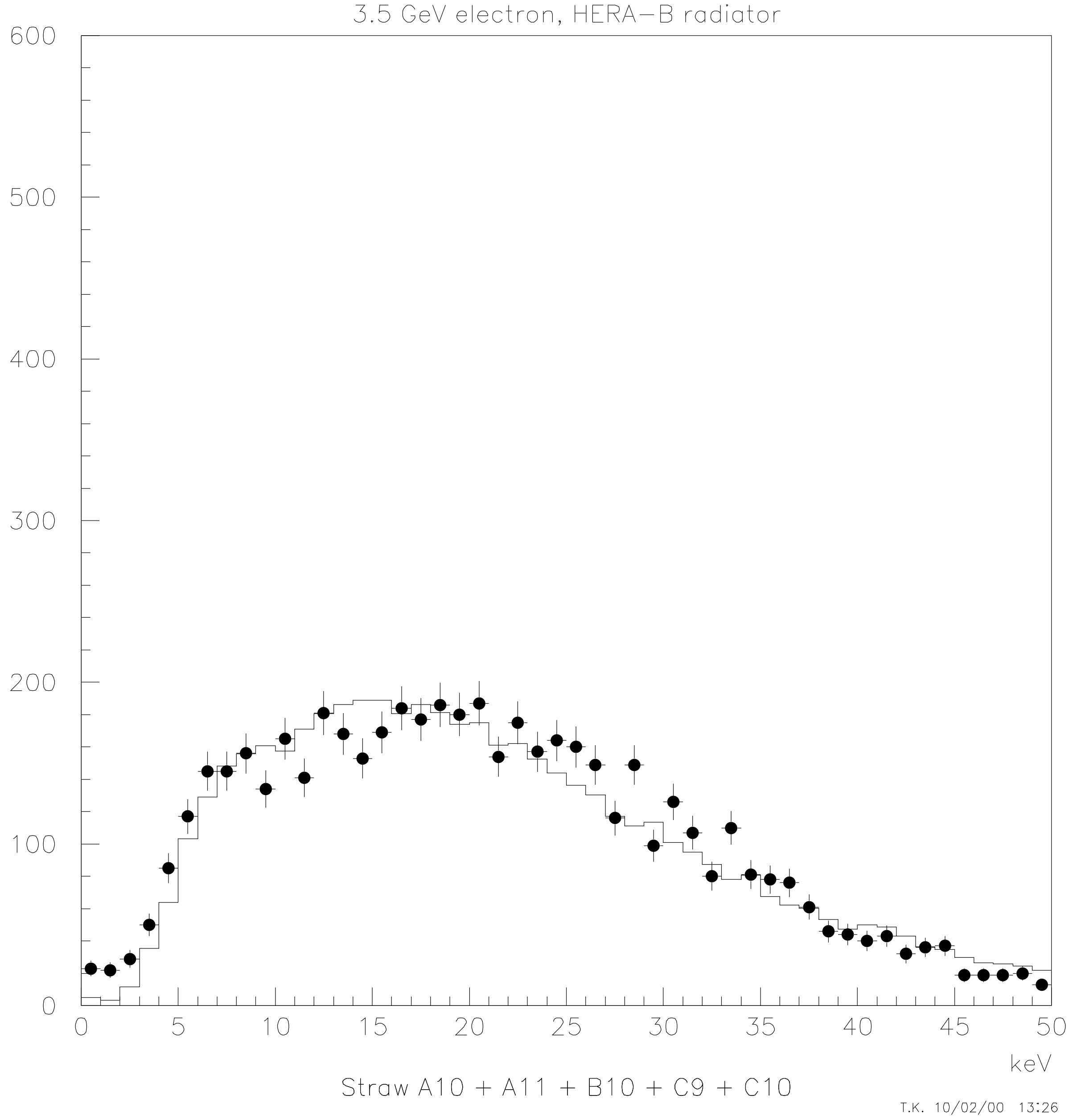
Testbeam Measurements



Testbeam Measurements



Testbeam Measurements



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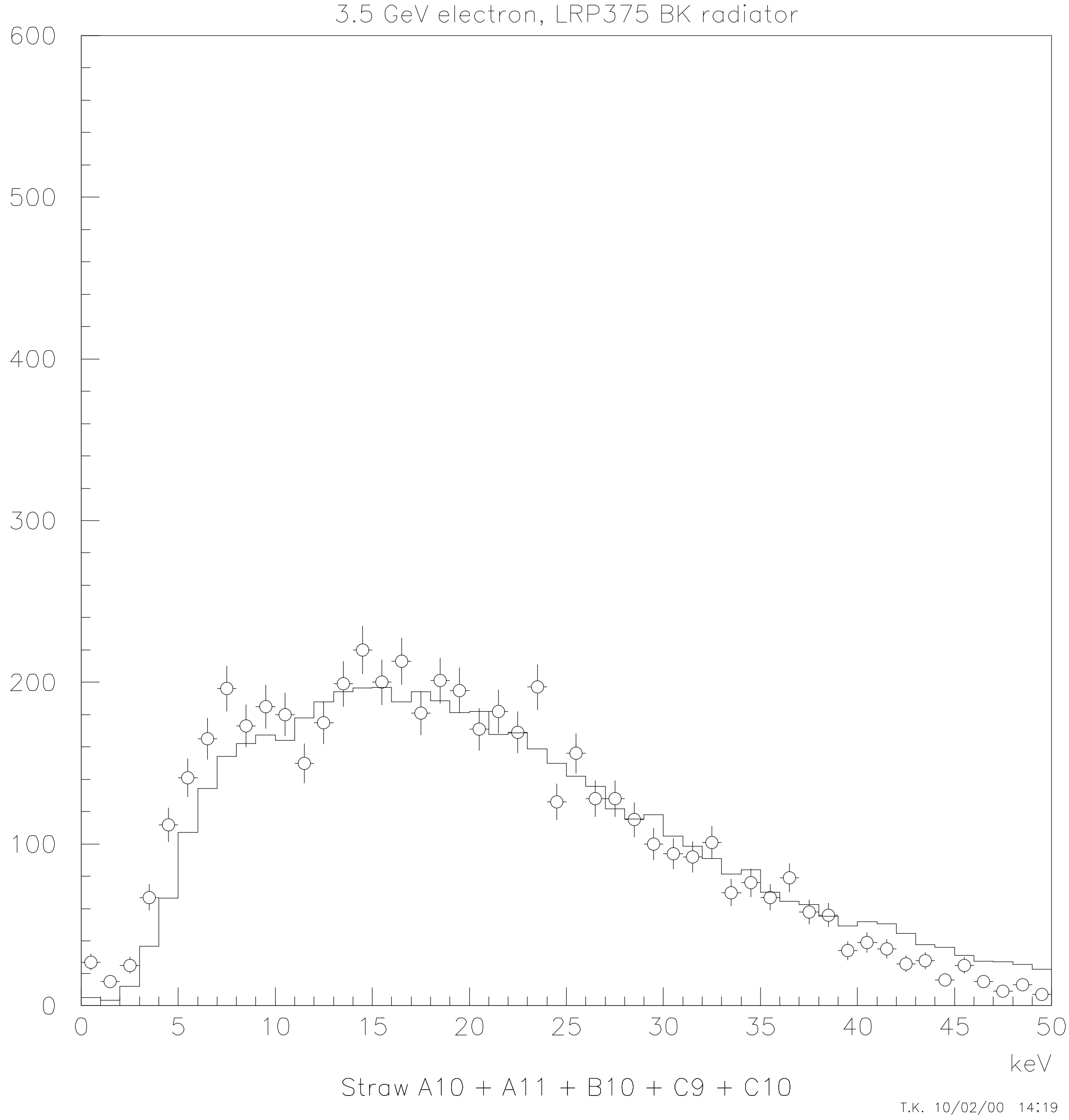

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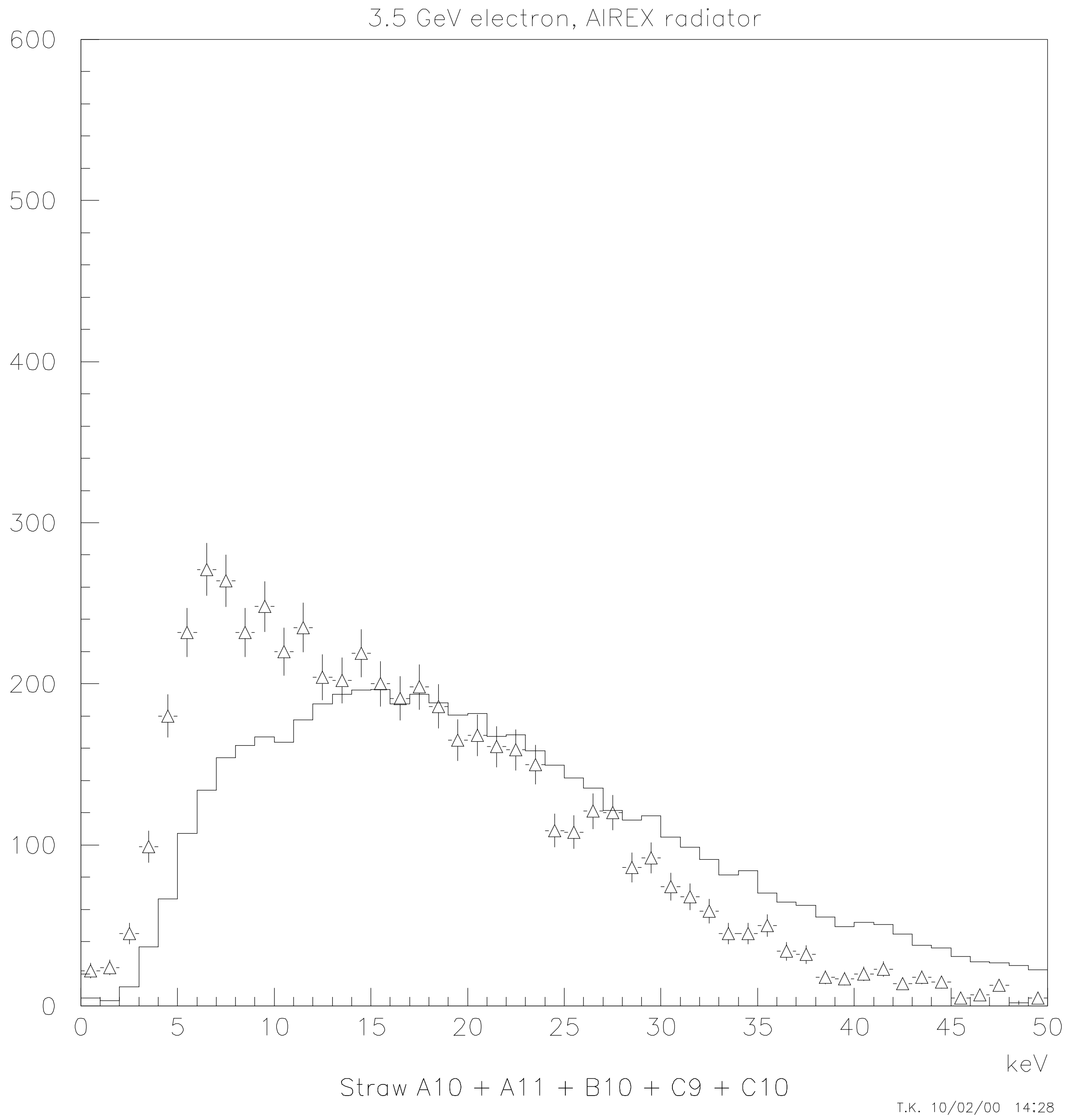

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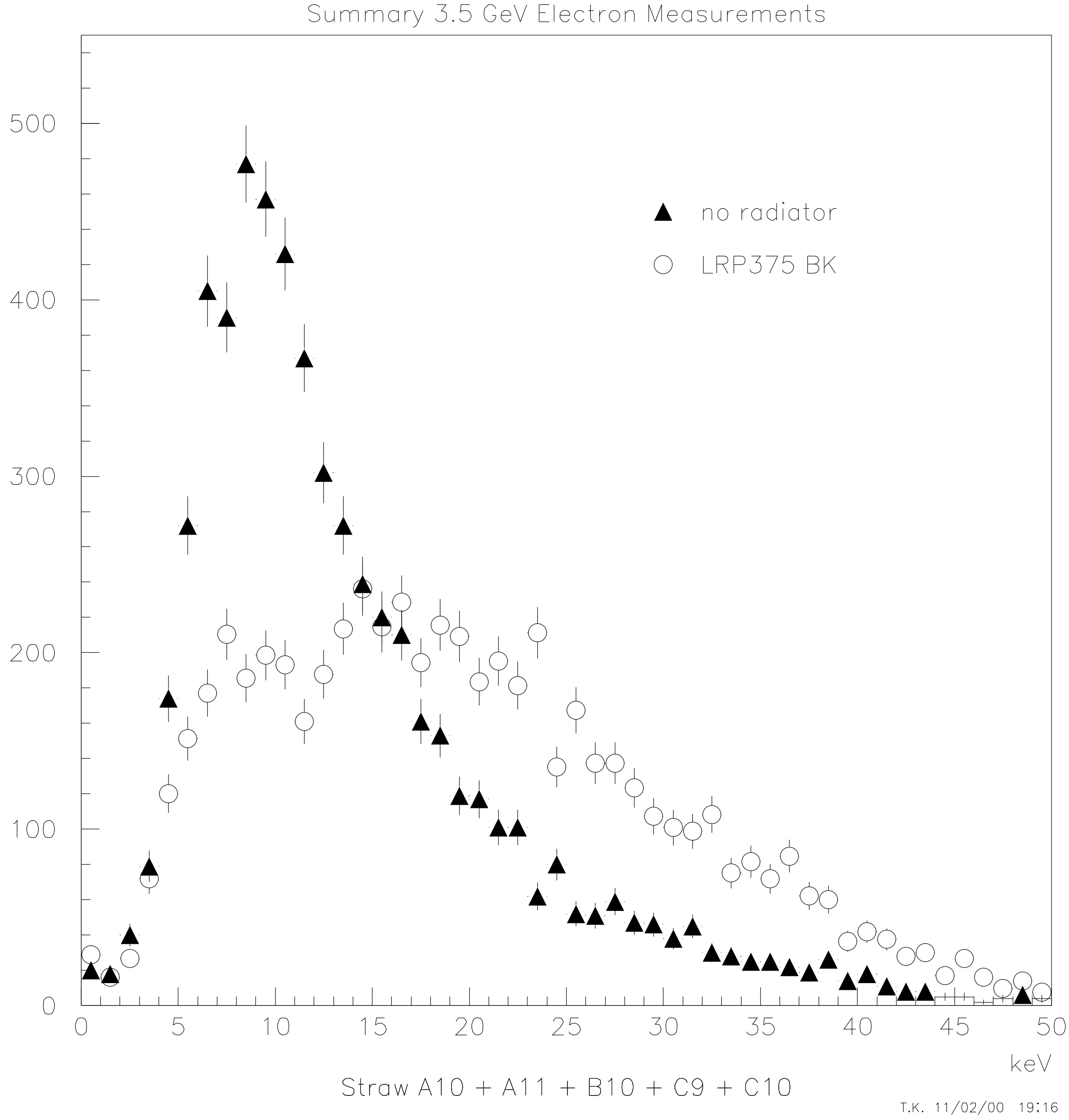

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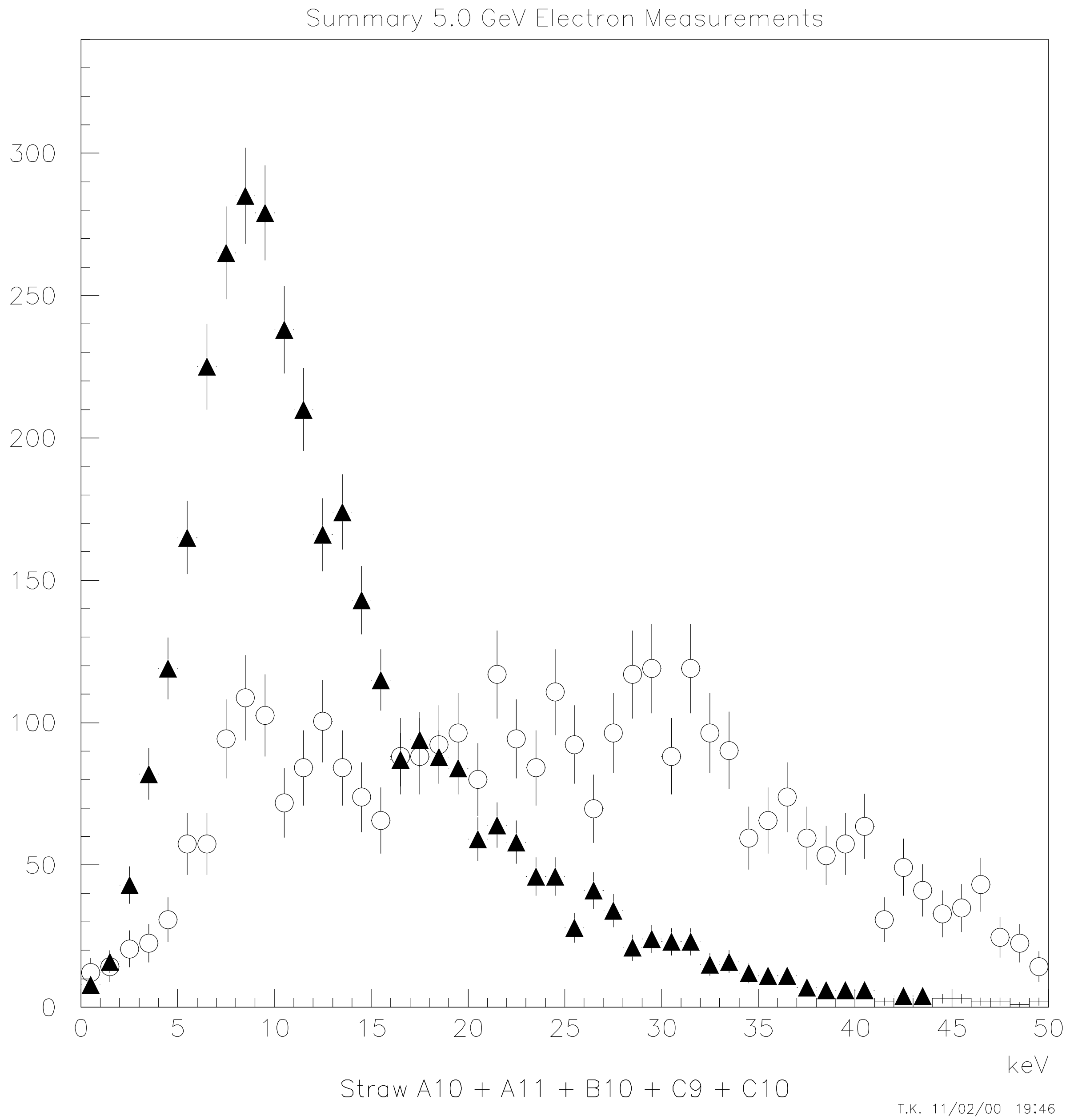

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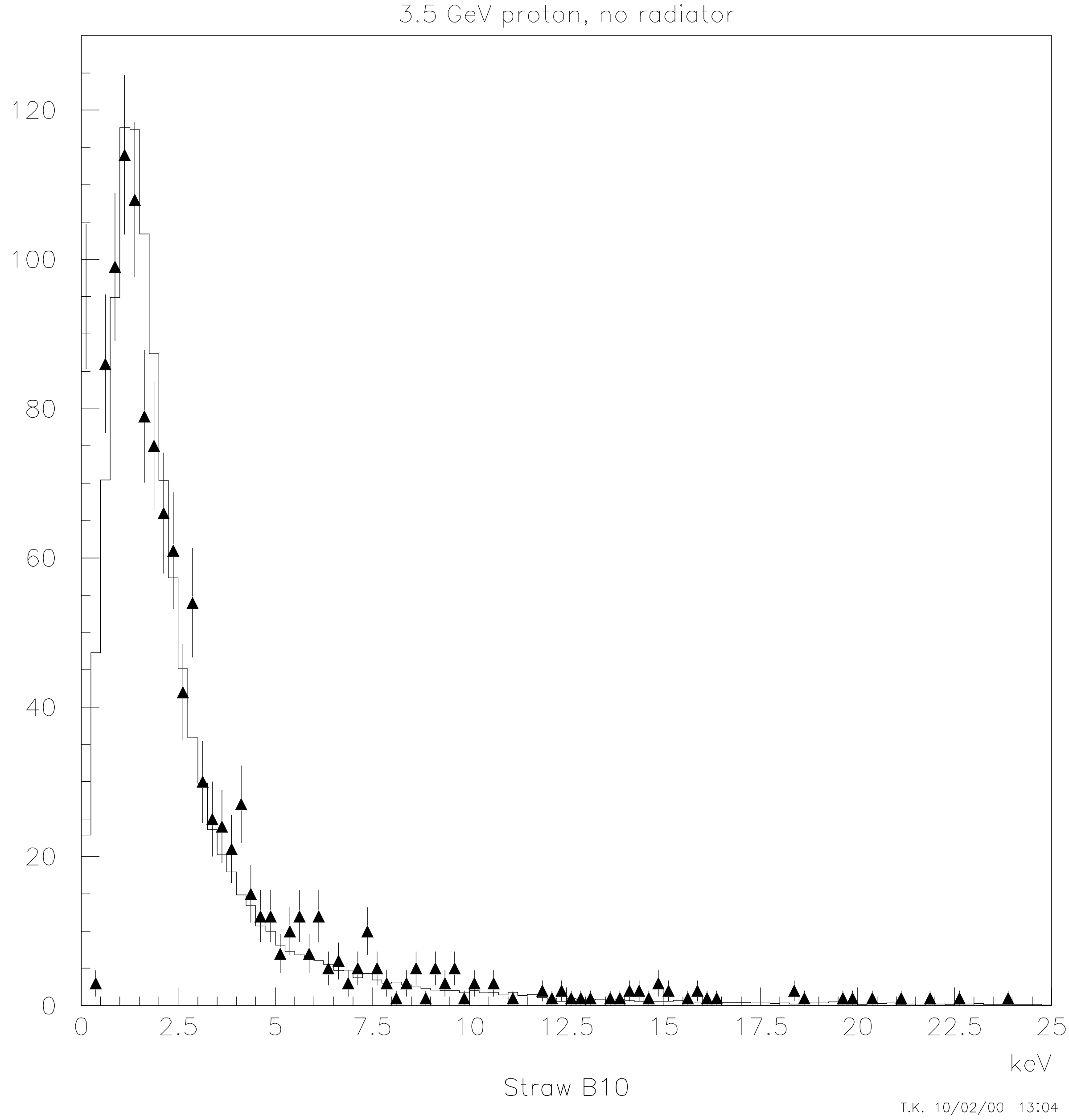

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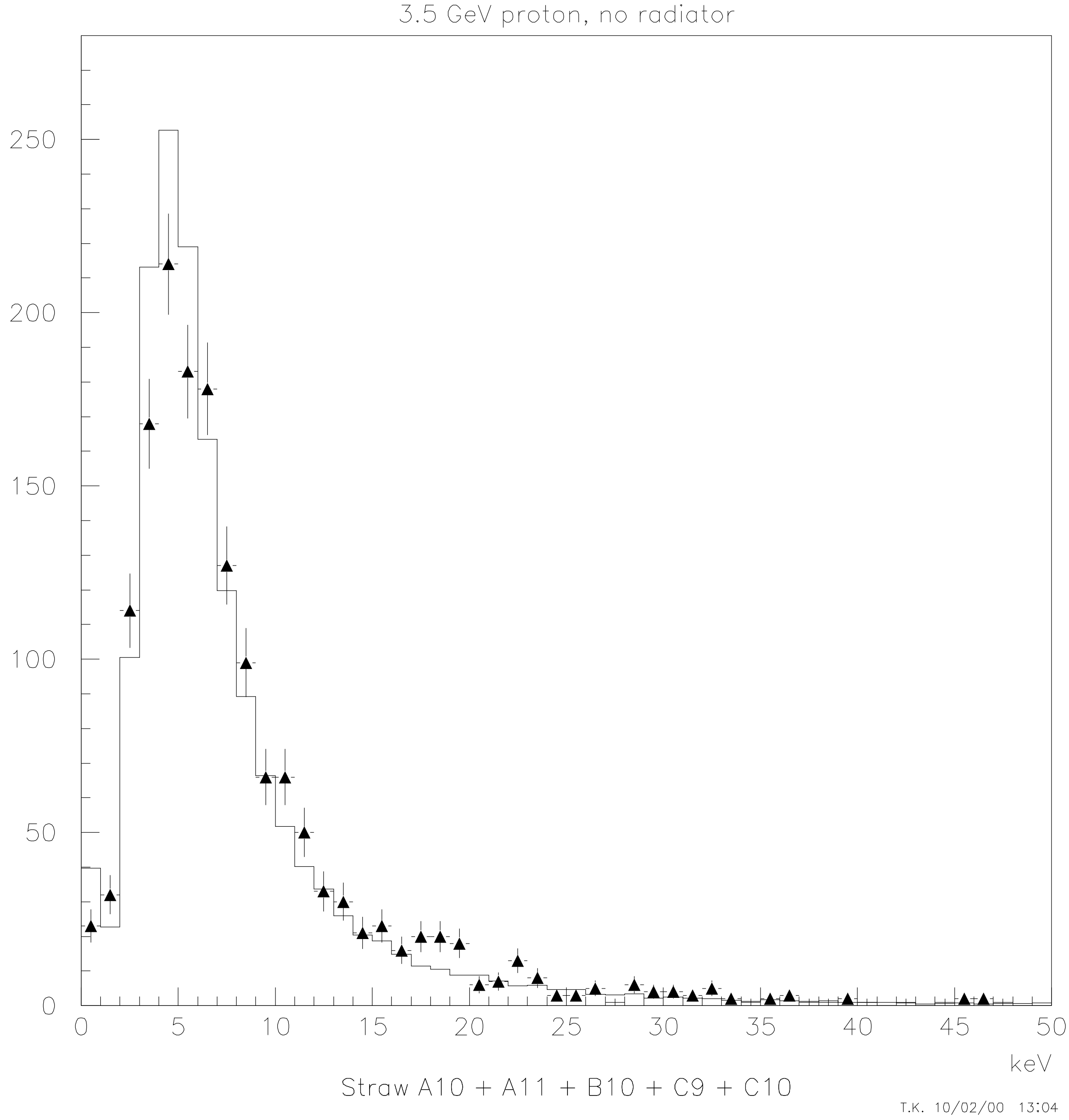

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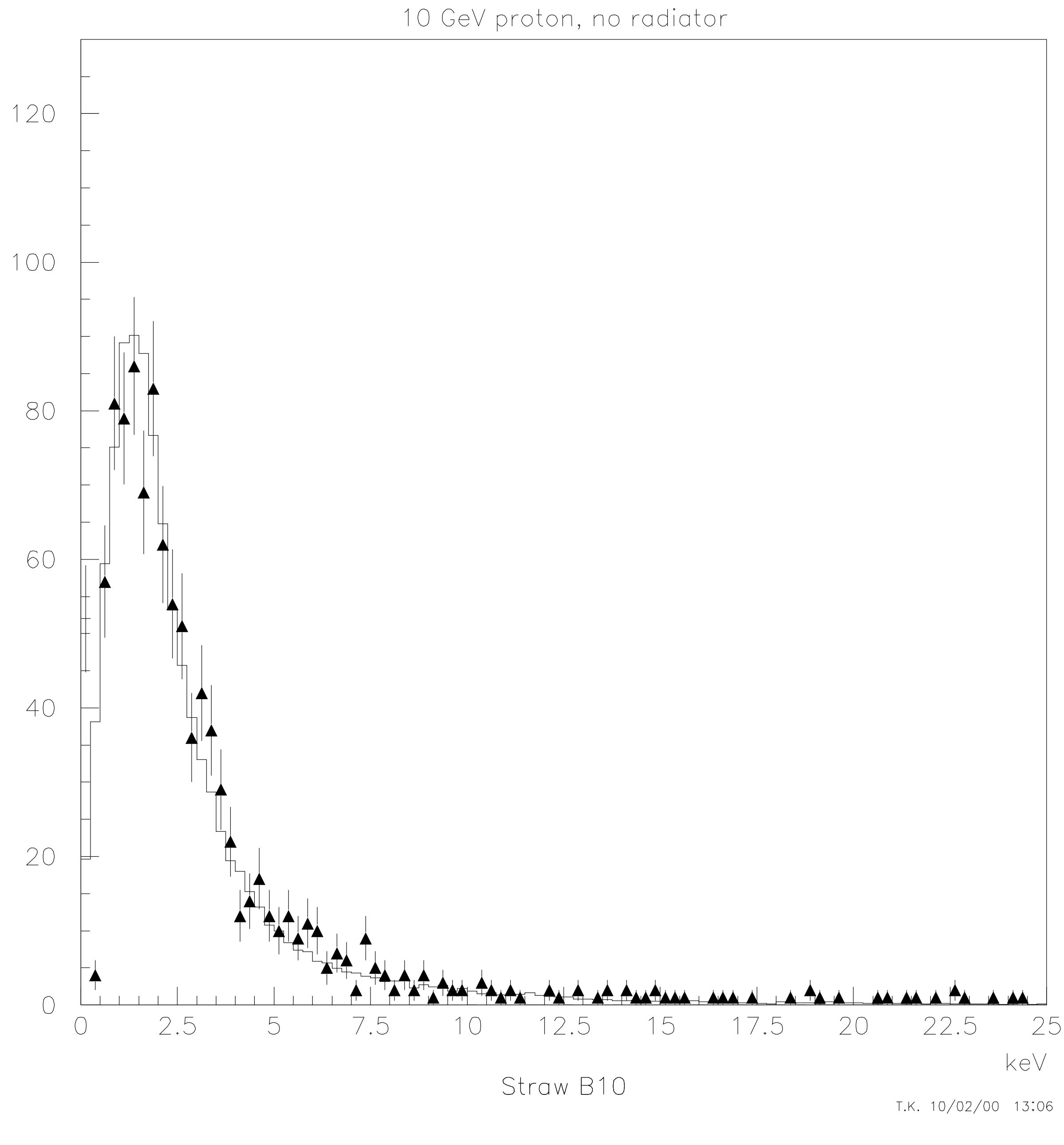

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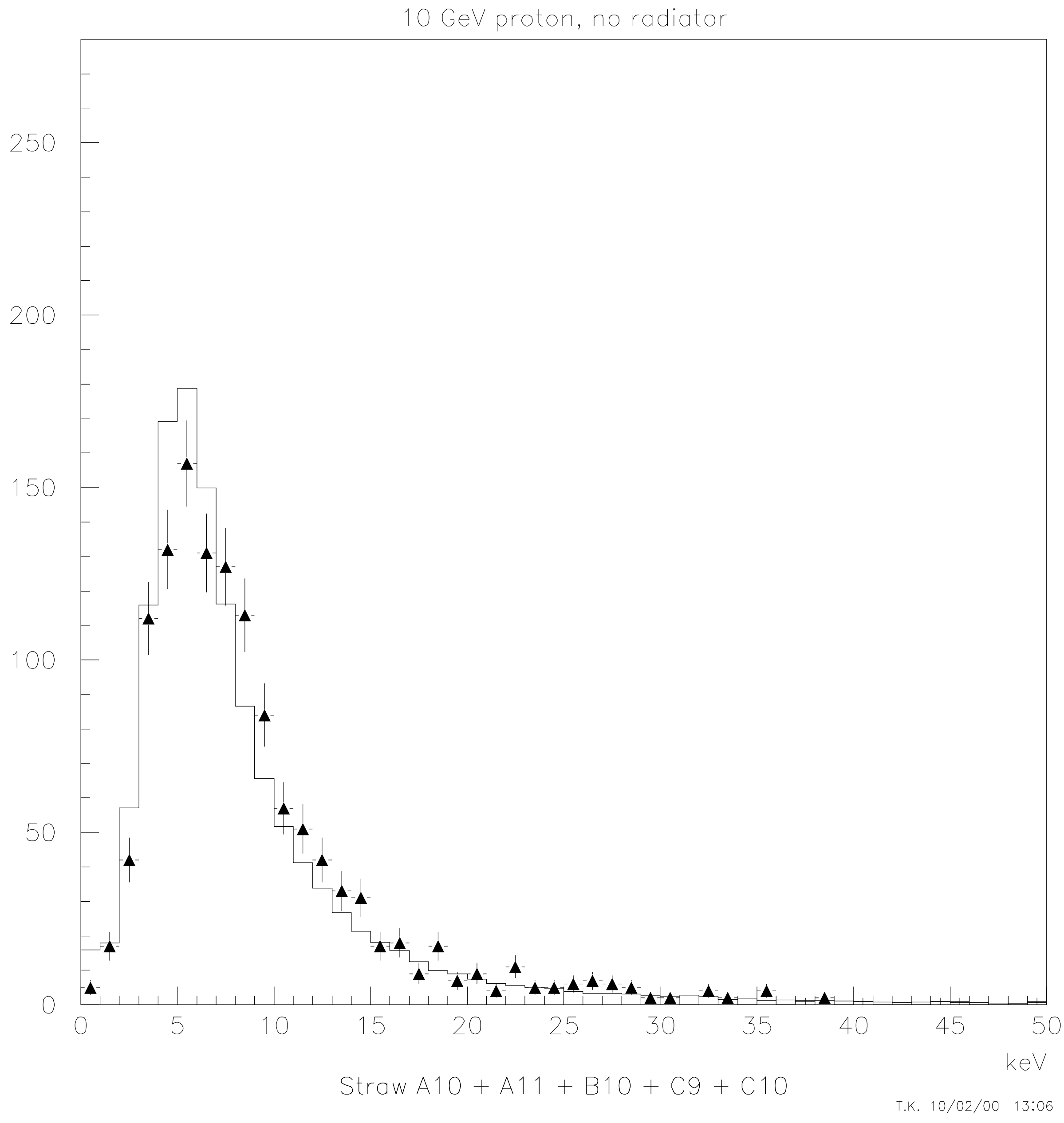

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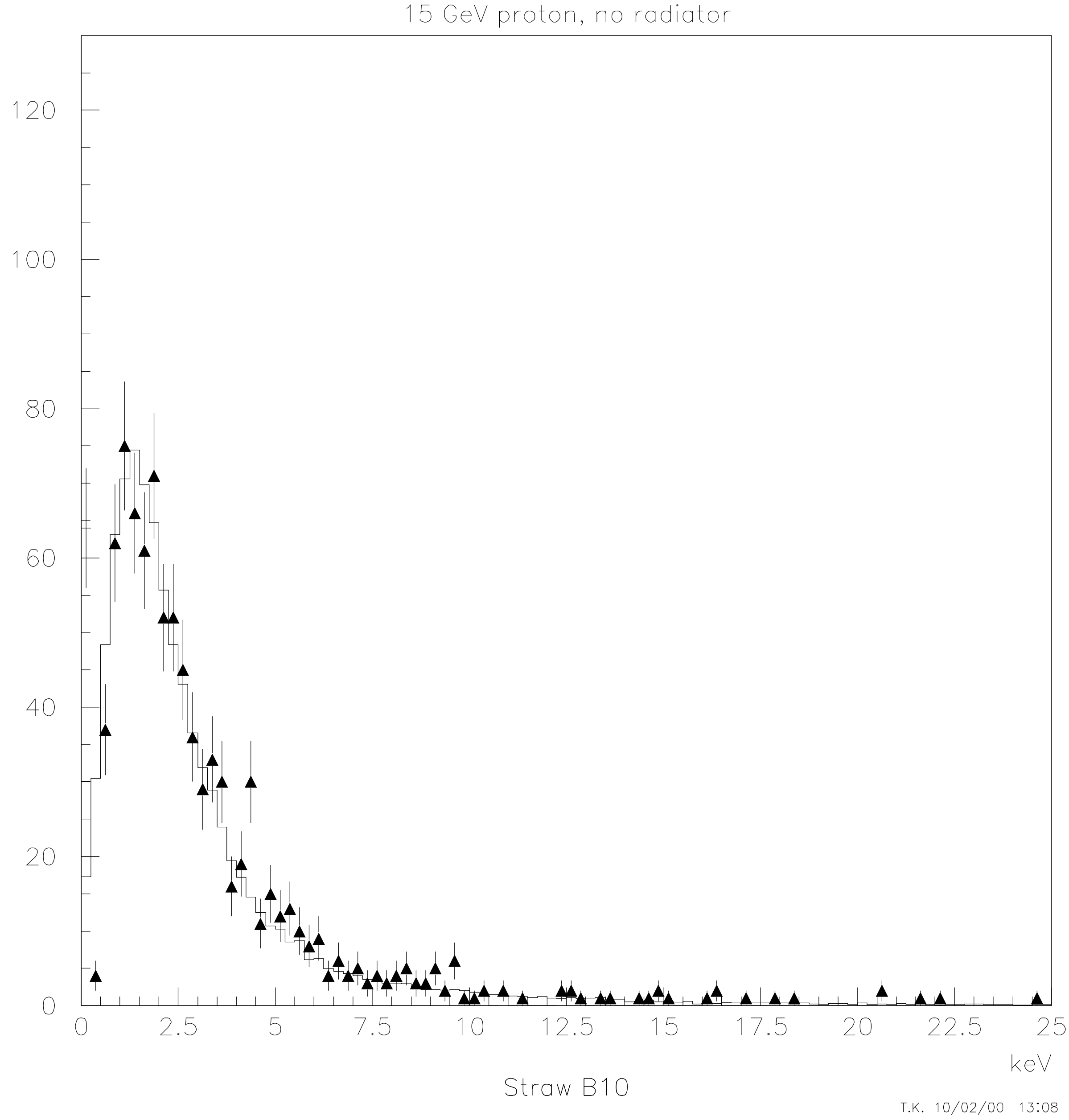

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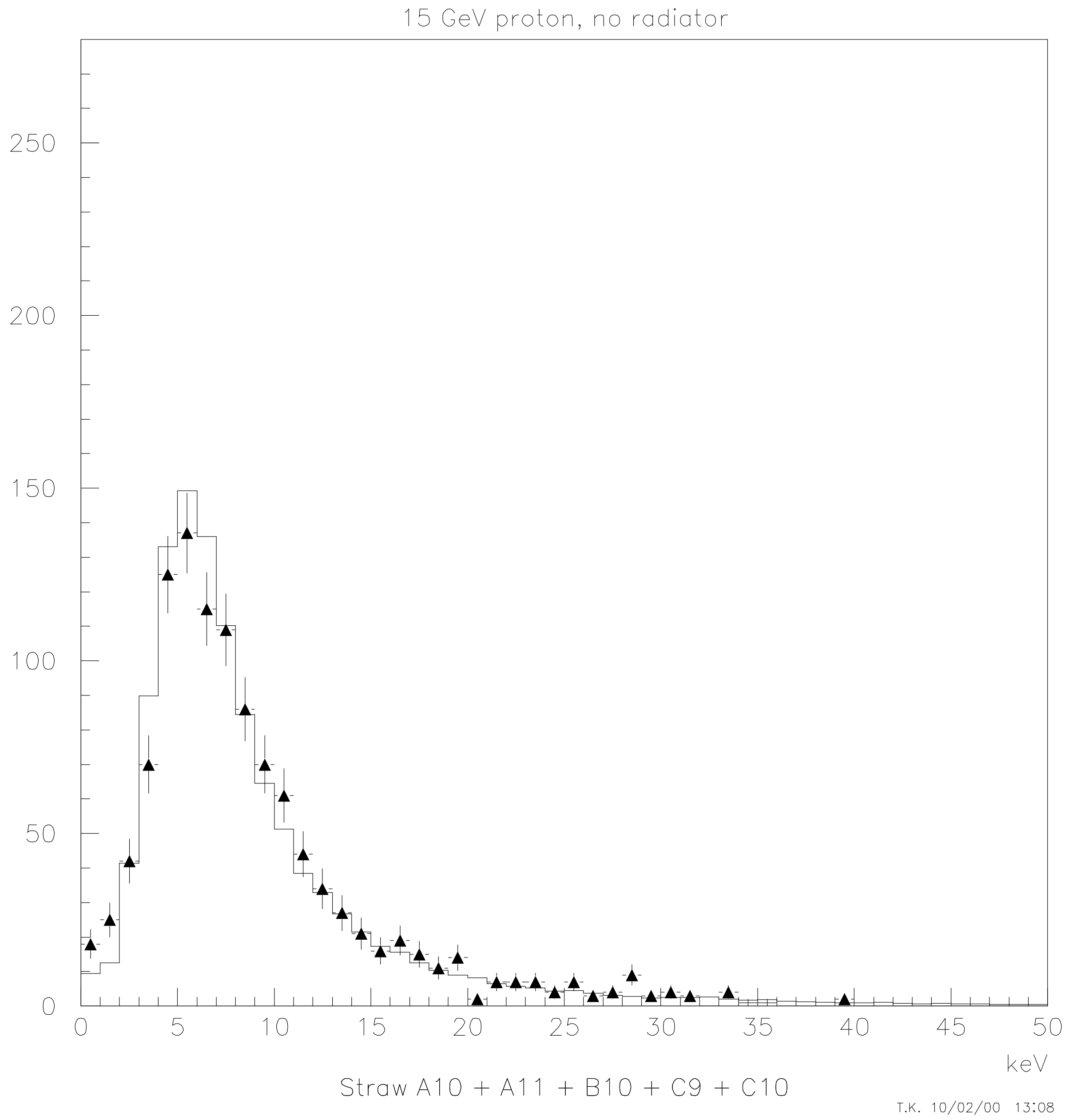
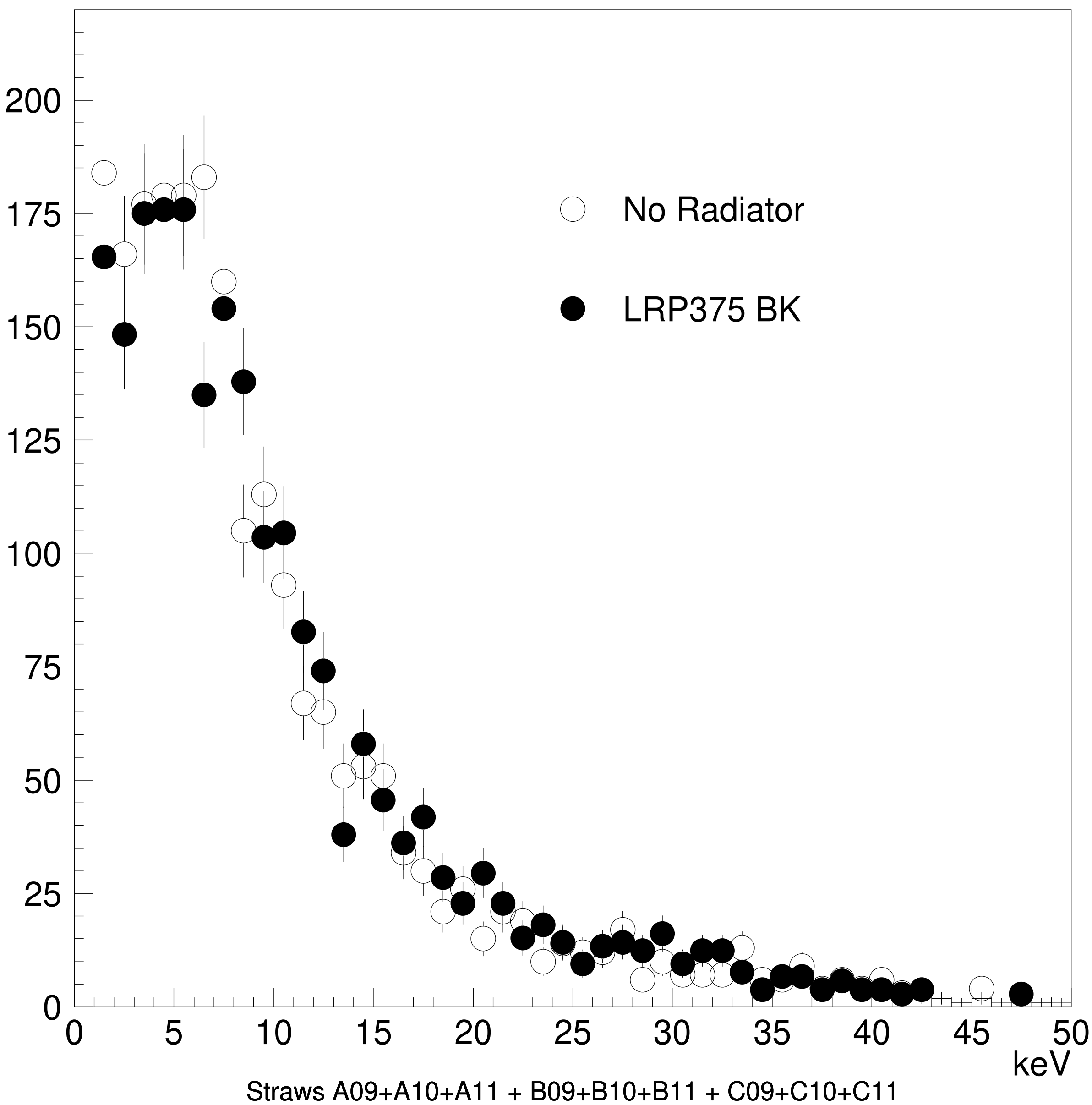


Testbeam Measurements

15 GeV proton



Testbeam Measurements, Conclusion

- Agreement between MC and DATA satisfactory
- No difference between HERA-B and LRP375 BK radiator
- Airex produces less transition radiation