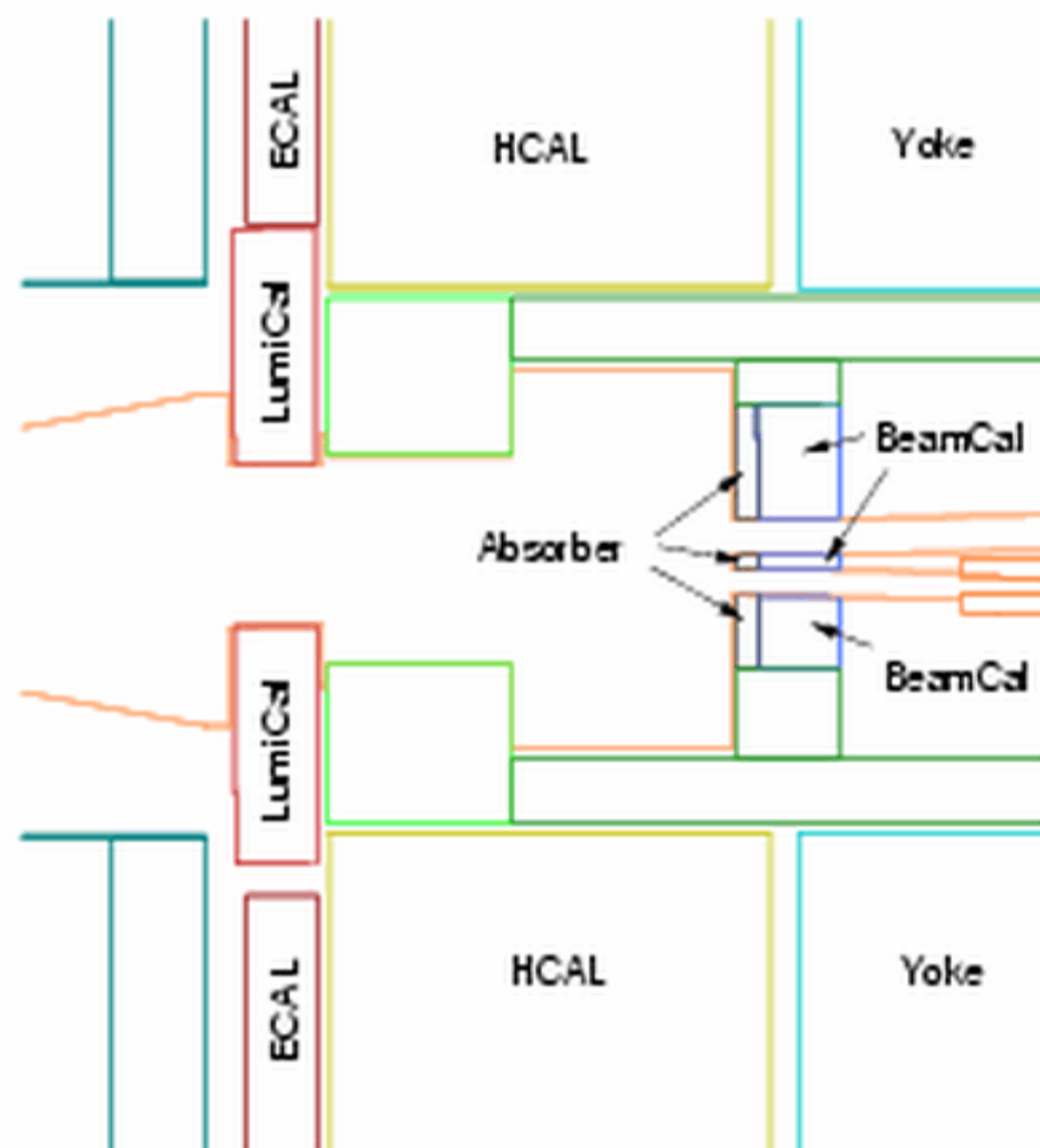


Studies on absorbers for background
suppression in the forward region of the LDC
detector at the planned International Linear
Collider ILC

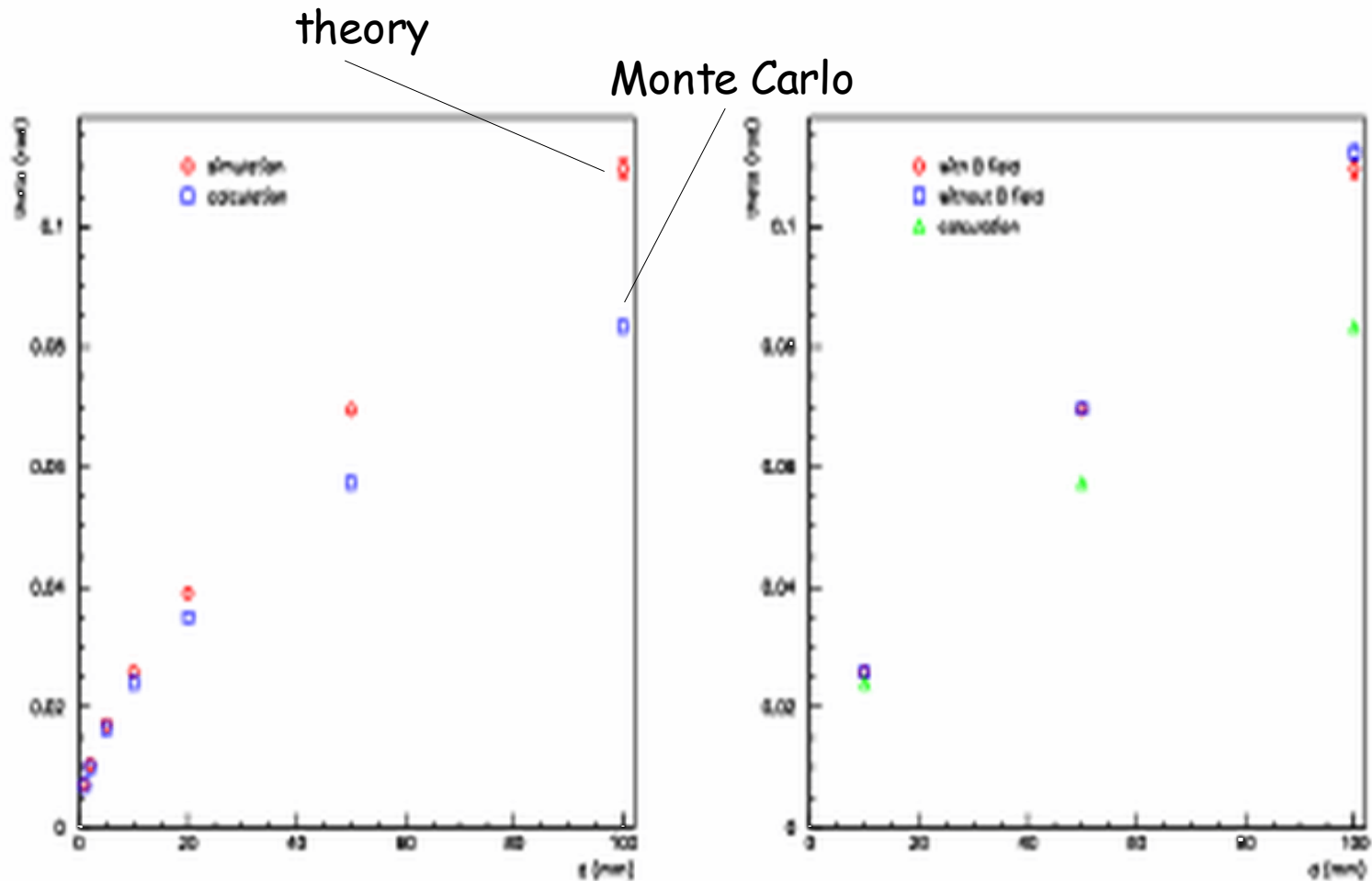
Svenja Niehage

University of Würzburg

Design of the Forward Region



Comparison Theory - GEANT4



no B-field, different thickness

different magnetic fields

Measuring back scattering

differentiate between two layers

layer 1 sensitive layer in front of the graphite absorber

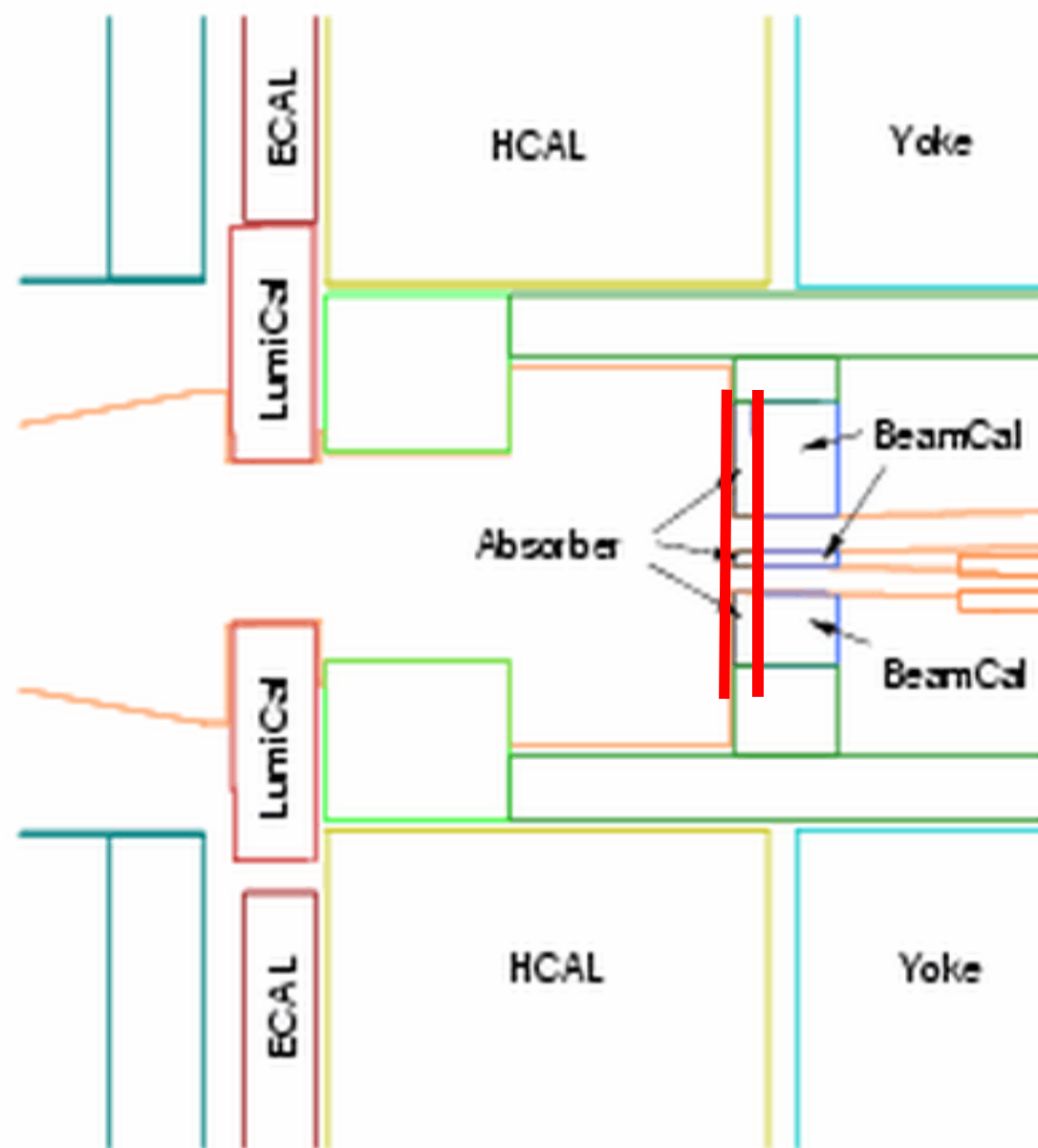
layer 2 sensitive layer between graphite absorber and detector

two types of particles

all all particles passing through layer 1

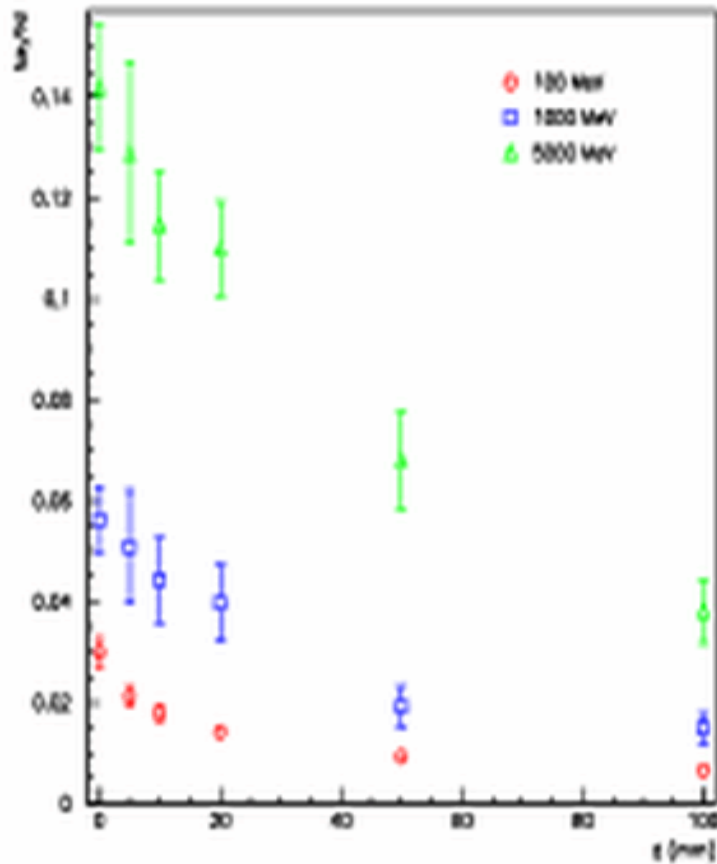
detector only those particles going through layer 1 and layer 2

Design of the Forward Region

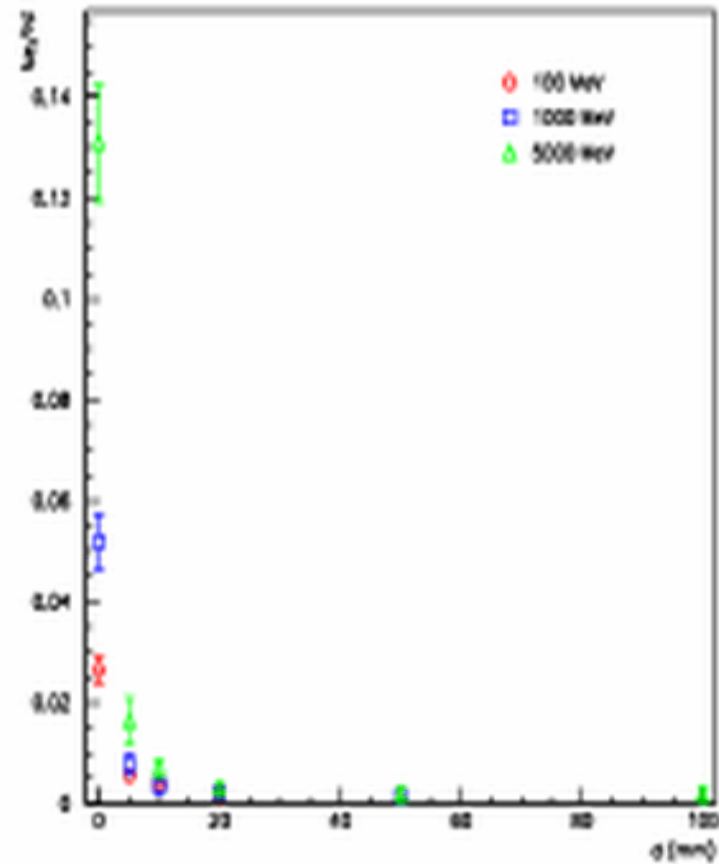


Electrons and Positrons

fraction of particles backscattered and existing from the graphite layer

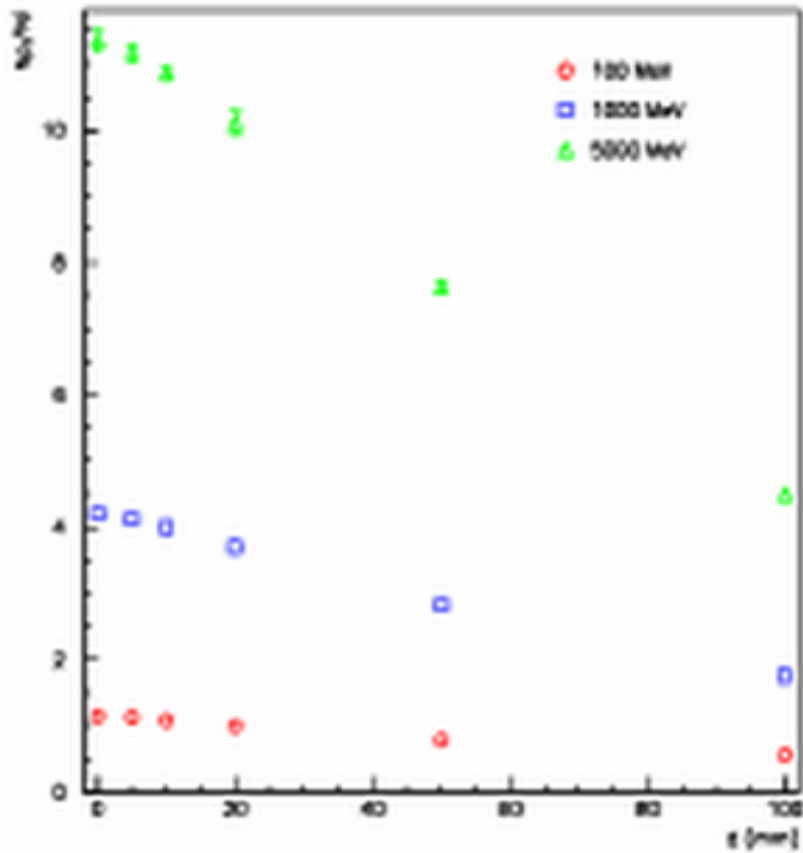


all particles

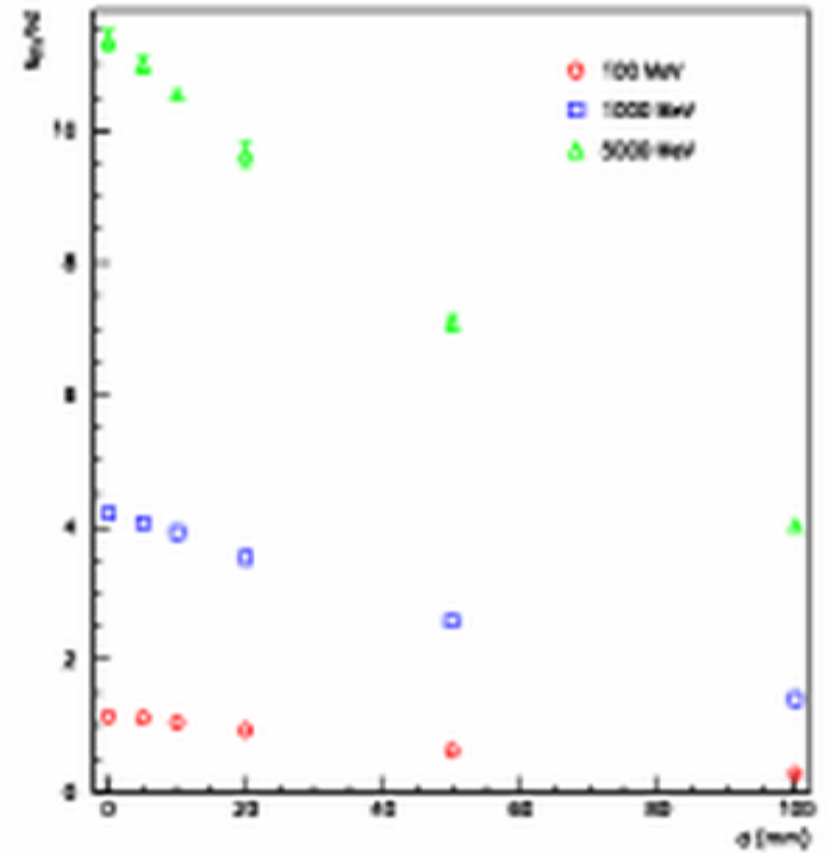


only those backscattering from the detector

Photons

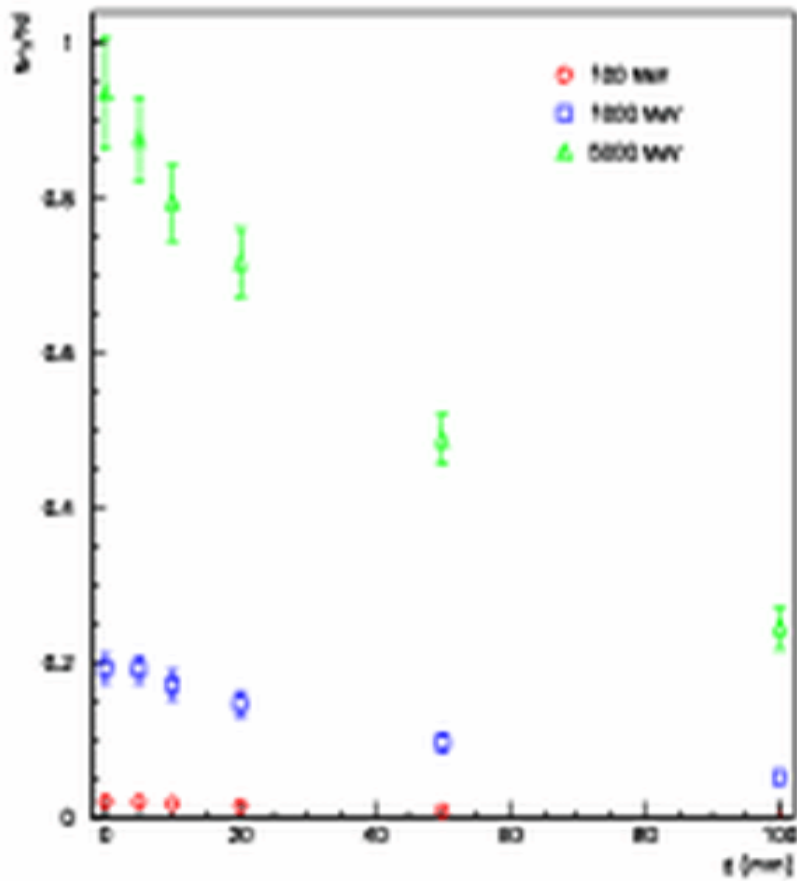


all particles

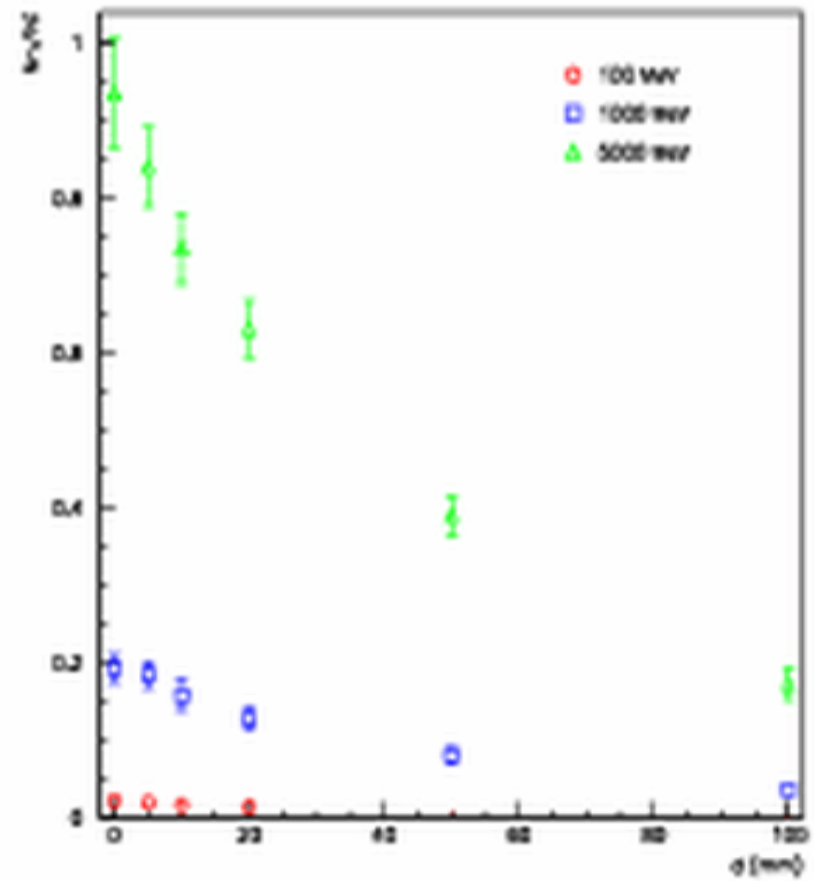


only those backscattering from the detector

Neutrons



all particles



only those backscattering from the detector

Be vs C

Compare the graphite absorption layer to a similar beryllium absorption layer

- electrons with 1000 MeV shot on beryllium layer with different thicknesses
- analyse for all particles and for the detector particles
- compare to graphite

Conclusion: no significant difference seen between Graphite and Beryllium

Conclusion

- The Absorber in front of the beamcal does its job
- a thickness of 4-5 cm seems reasonable, to significantly reduce the number of backscattered particles
- most scattering happens at the face of the detector (as expected)
- There is no significant difference between Beryllium and Graphite

Work done by Svenja Niehage (summer student at DESY)
in collaboration with Adrian Vogel and Karsten Buesser