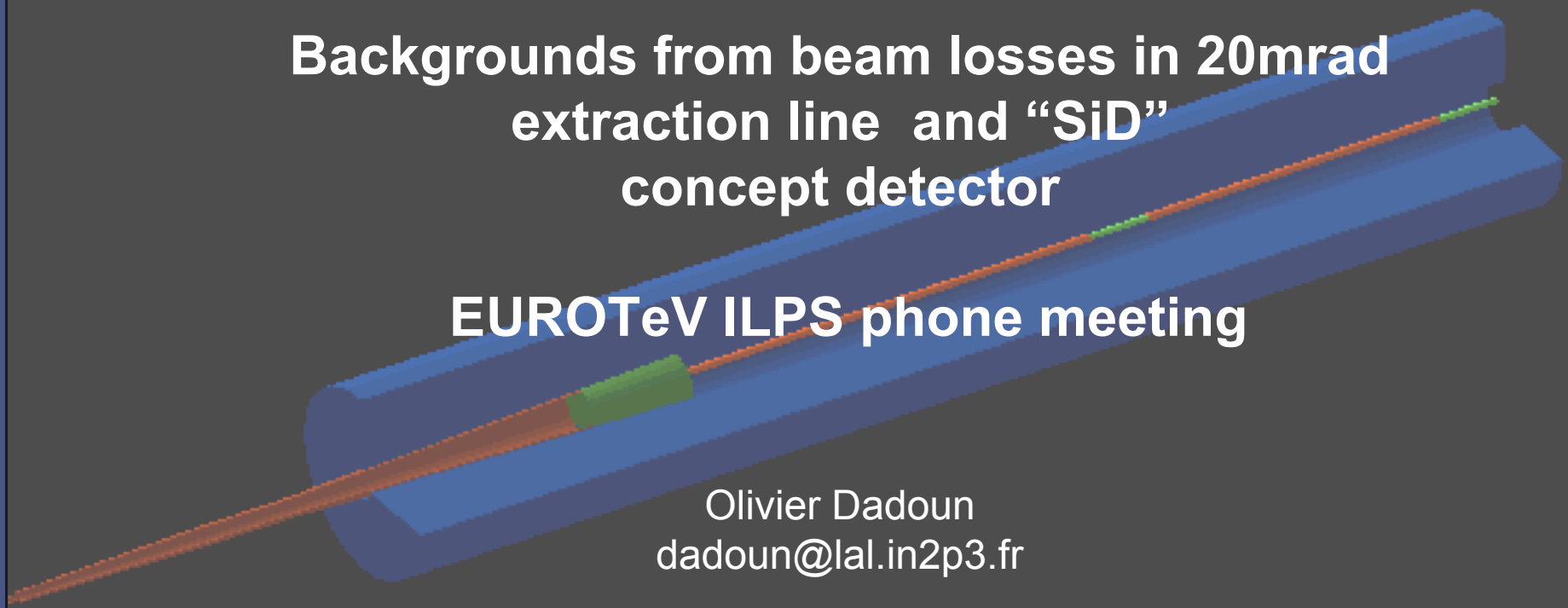
Backgrounds from beam losses in 20mrad extraction line and "SiD" concept detector

EUROTeV ILPS phone meeting



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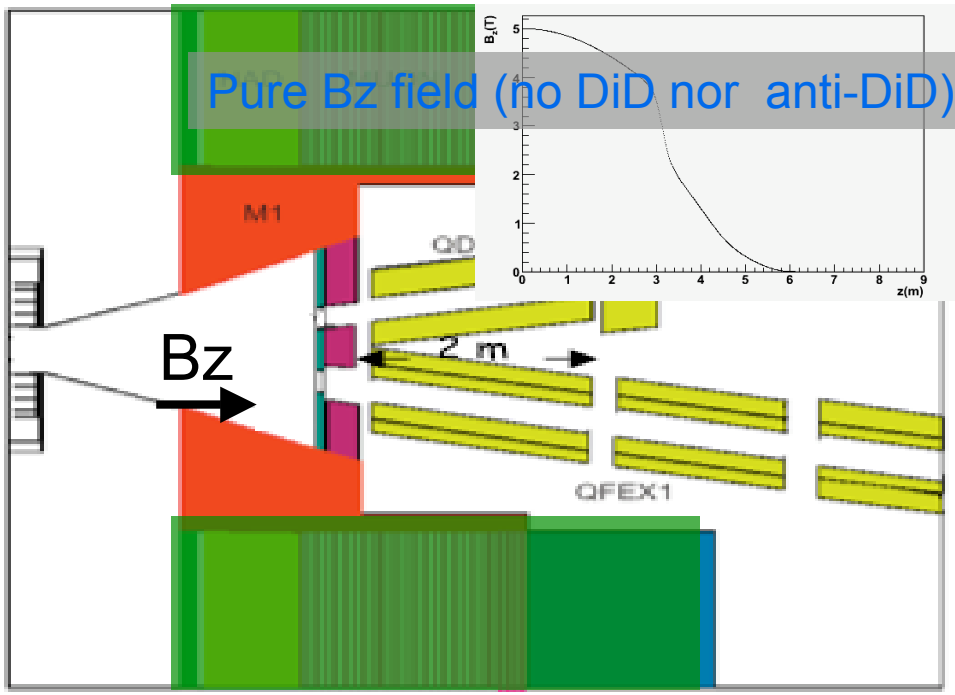
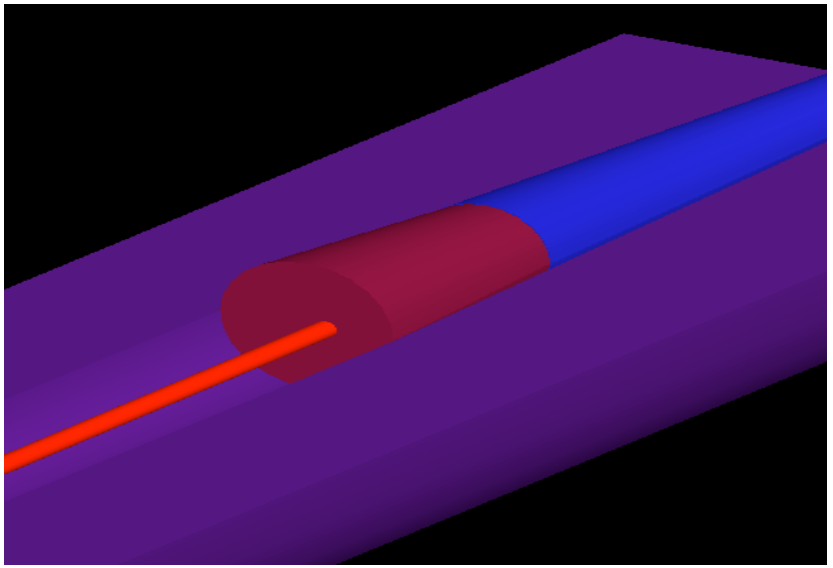
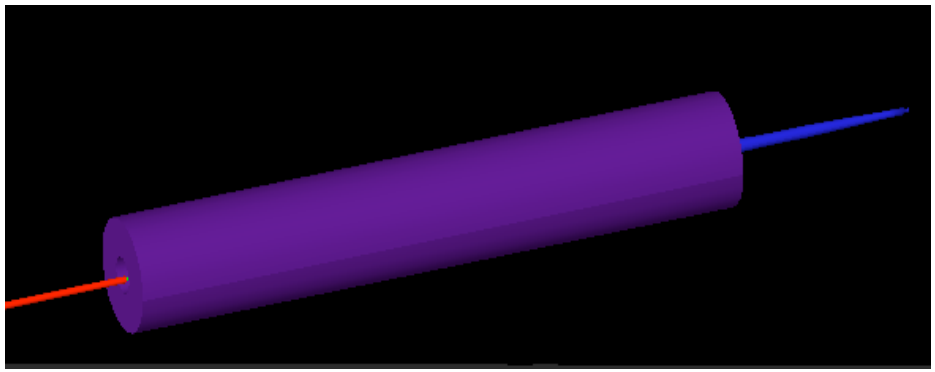
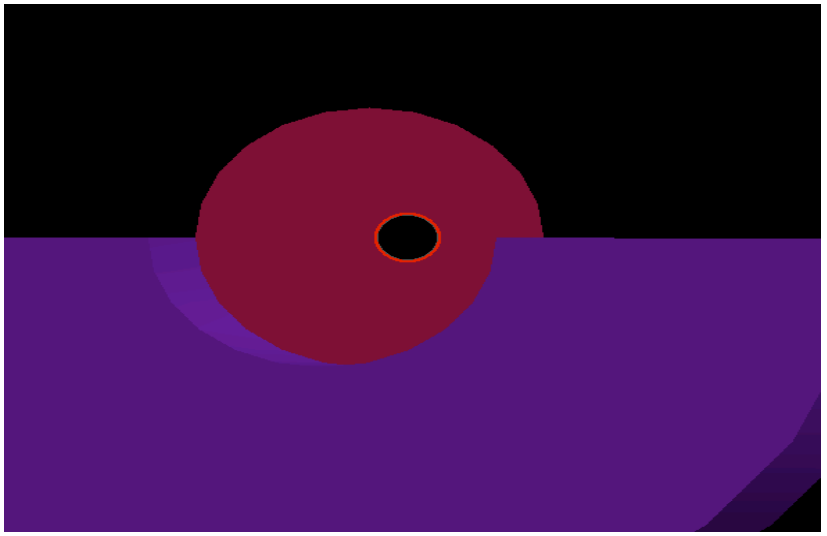
“SiD” detector concept

Pure Bz field (no DiD nor anti-DiD)



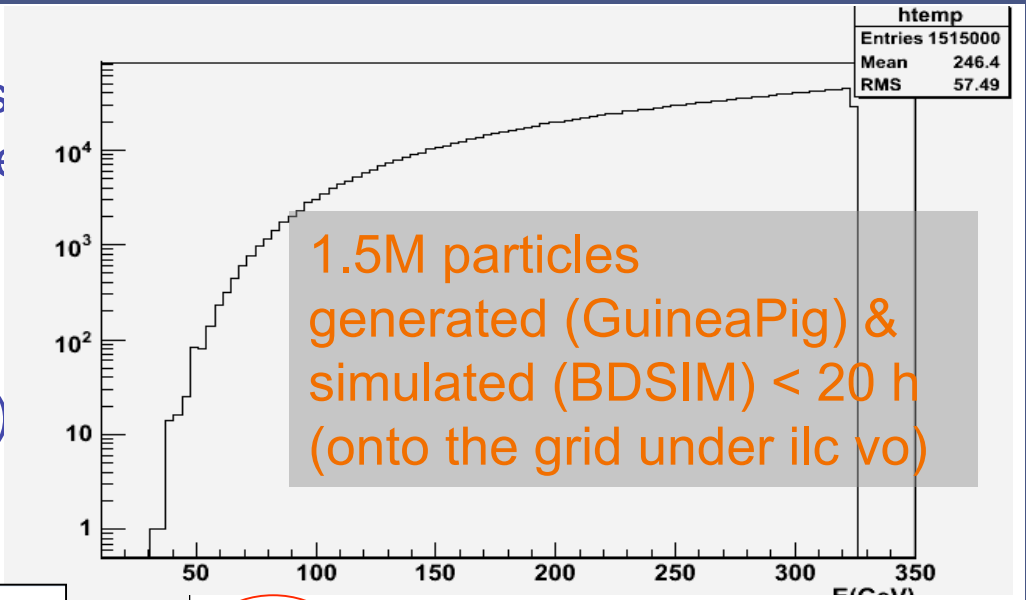




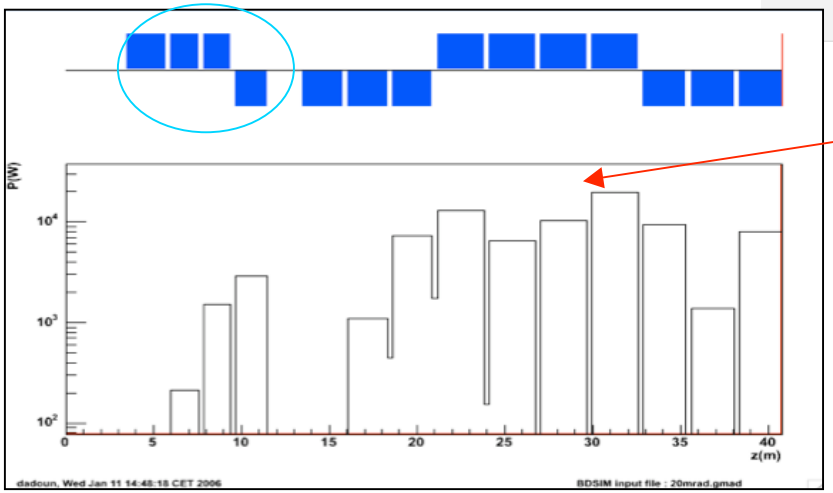


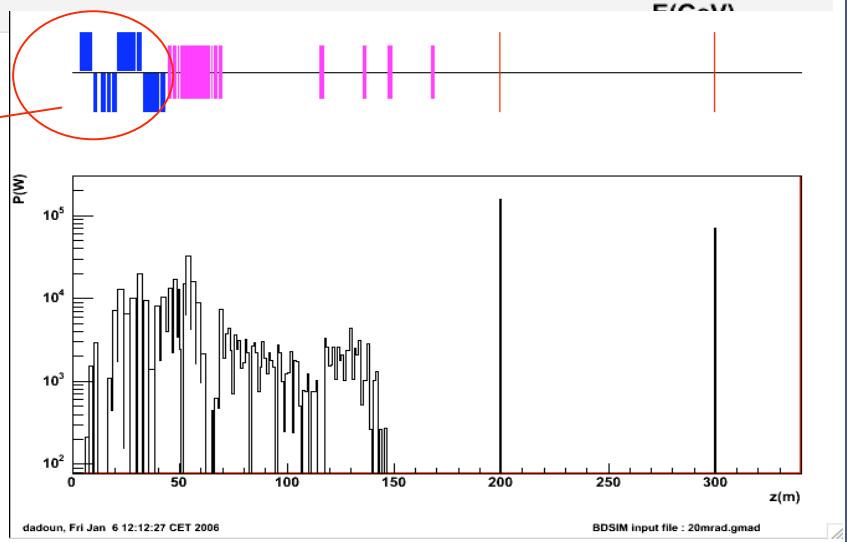
Backgrounds from beam losses in 20mrad extraction line

- To maximize the power losses and the secondaries I used the High luminosity beam parameters @ 1TeV machine with dy=80 nm beam offset (worst case not really realistic)

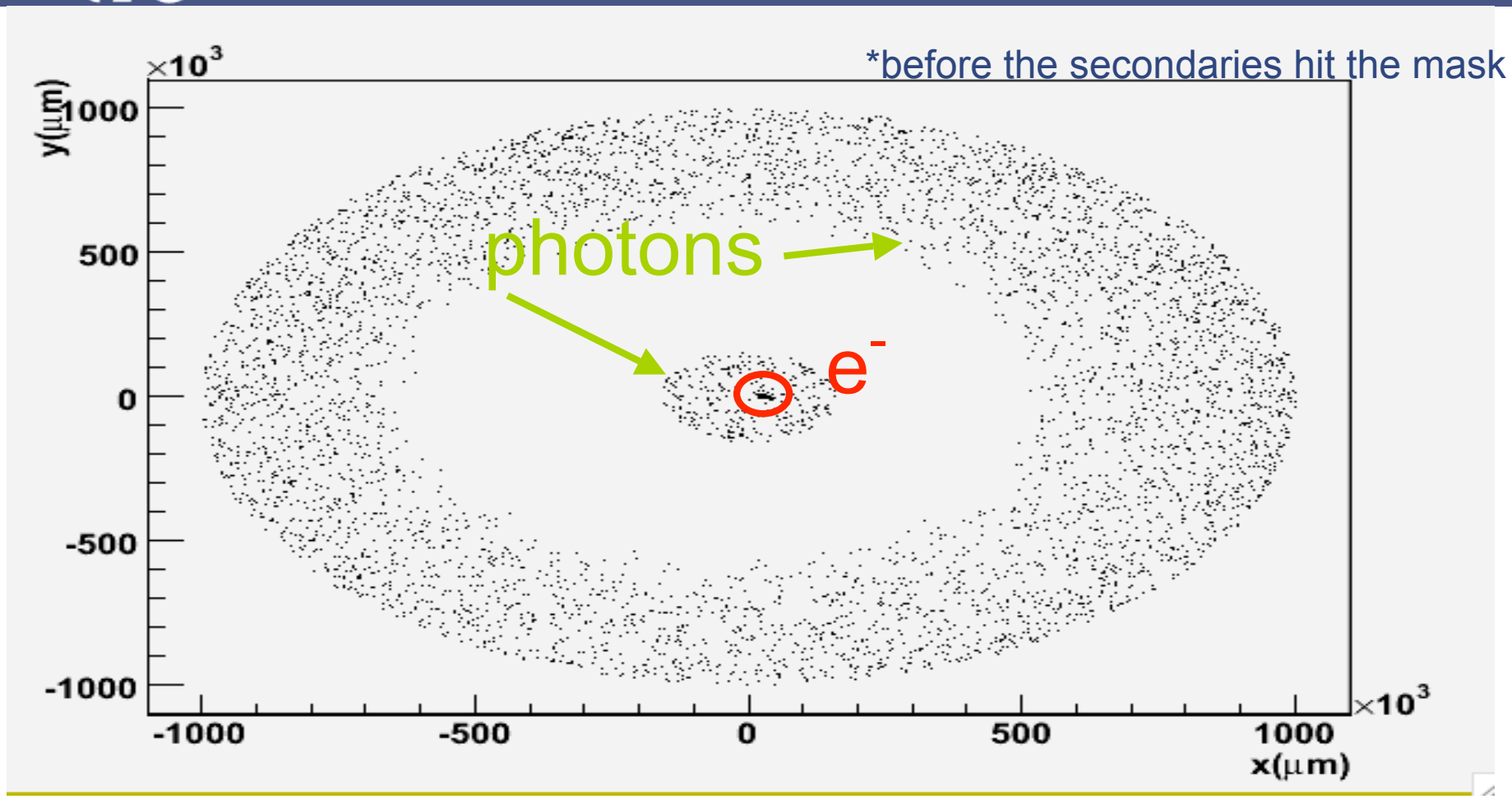


SC magnets



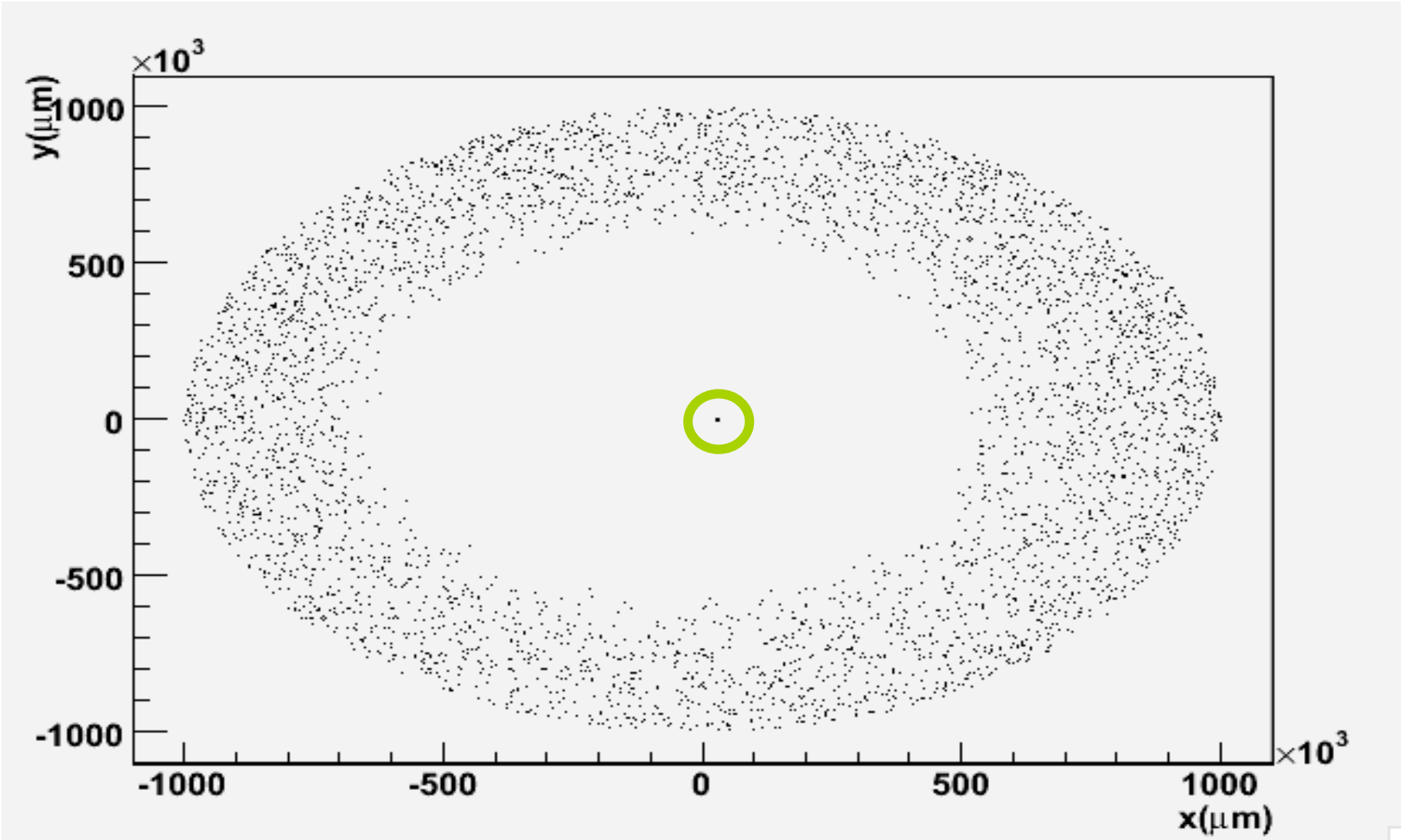


Backscattered particles @ 3.5m before* the mask



- 7602 backscattered particles:
  - 5267 photons, 2311 e^- & 24 e^+

Tungsten mask stop most of the photons (center region)



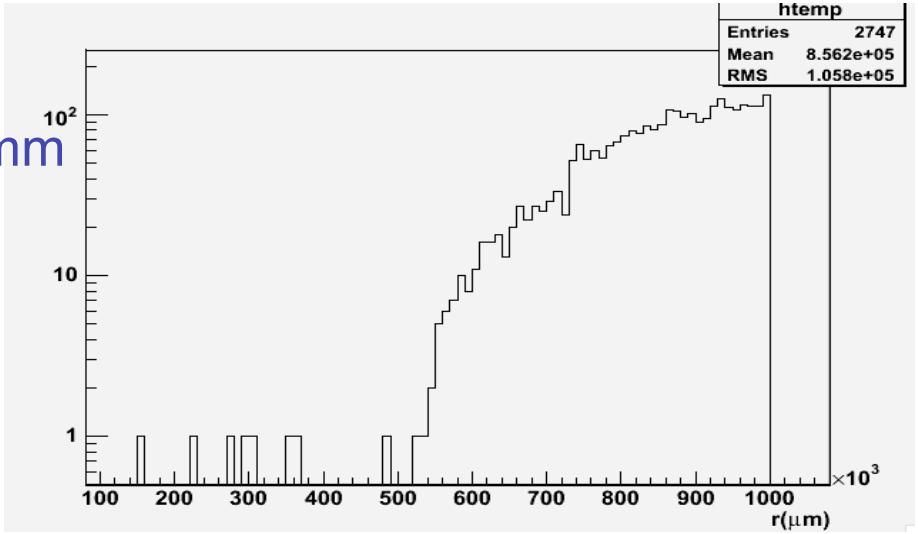
… But some of them can reach the detector

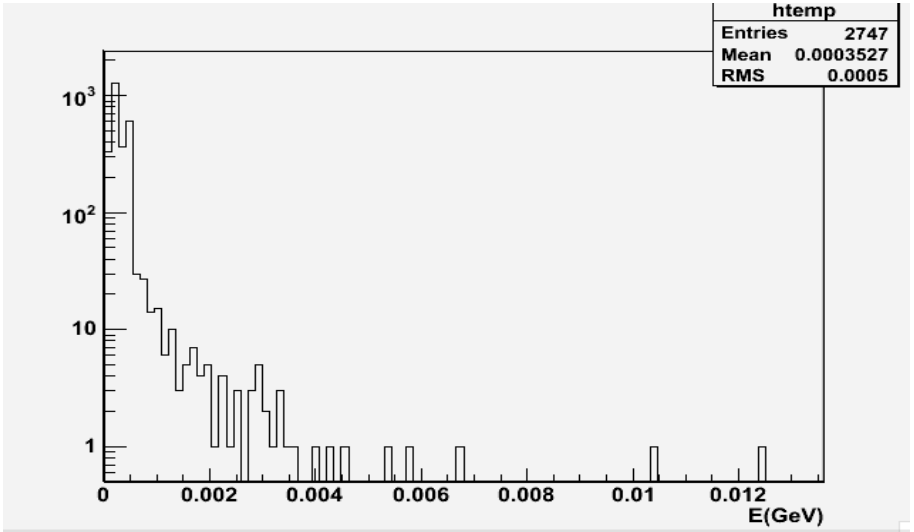
- If we consider the last layer @ 60mm
- 300 mm Si thickness
- 1% photoelectric (E~300keV)

- Backgrounds hits in VDX
  $< 1*(2*10^{10})/1.515*10^{6}*1\% = 132$

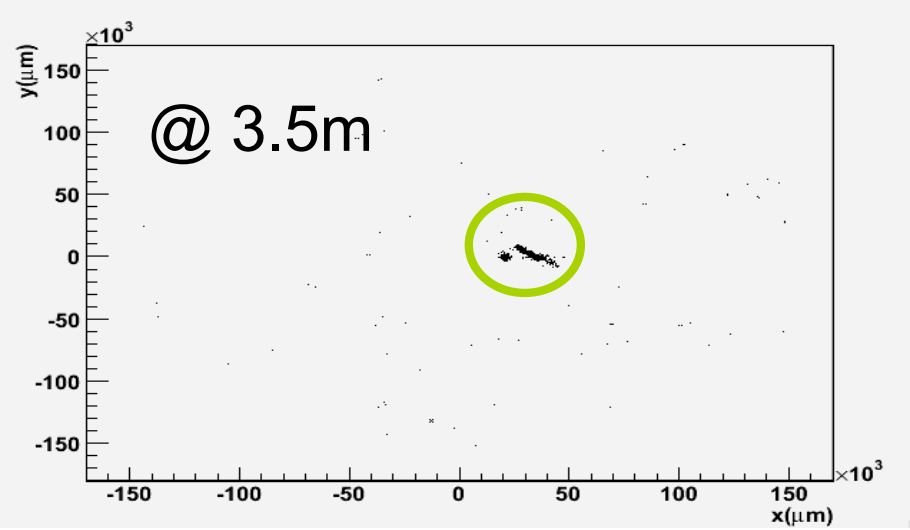
- To be compare to the 300 direct incoherent pairs hits …

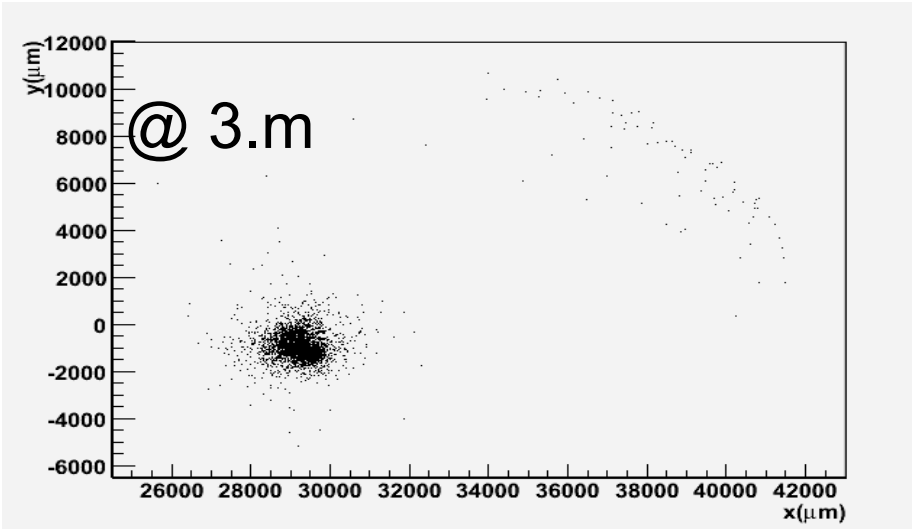
- Backgrounds hits the TPC …



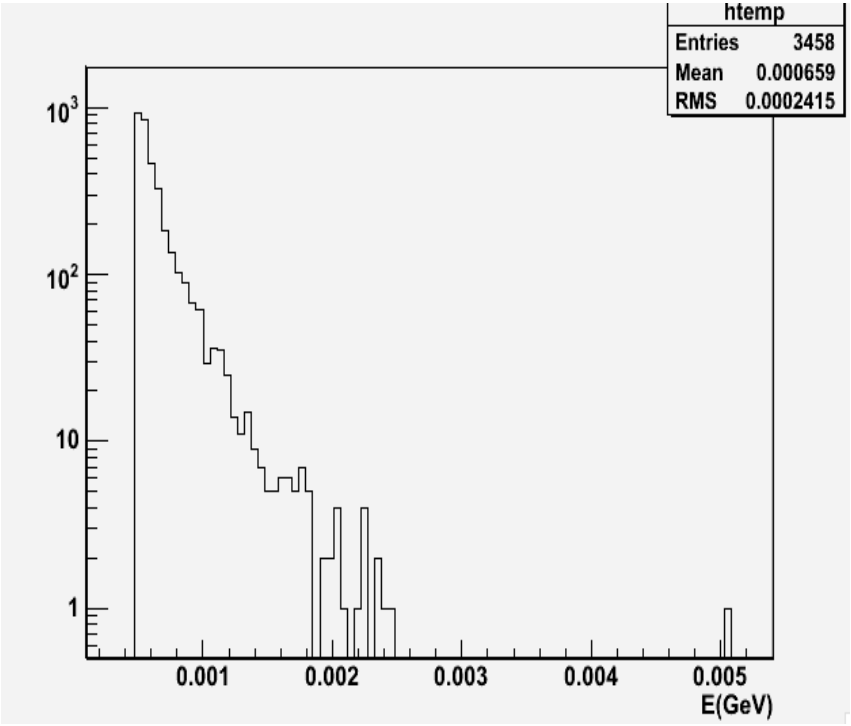


Backscattered e⁻





- 2mm of Aluminum beam pipe enough to stop 1MeV electrons
- no e⁻ can reach the VD



Conclusion and prospects

- BDSIM and GuineaPig onto Grid under ILC vo
- Backscattered not a problem
- Backgrounds will from photons generated along the extraction line …

Future

- Take the full Mokka description
- Take into account the losses from the radiative Bhabhas
- Put the hadronic flag on

- Paper on an Abacus power in the case of the 2, 14 and 20 mrad extraction line, using different beam parameters set:

ILC extraction line Power losses Abacus
case of the 2, 14 and 20mrad crossing angle

authors: Andrei, Arnaud, Cecile, Deepa, Grahame, Ilya, John, Olivier, Philip, Rob, Yuri