



GLD Background

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Introduction

- We study background effects for GLD.
- We develop beam line simulation program, LCBDS, based on GEANT4.
- Results we show today are obtained for three days work.



Theme

- Simulation tool (LCBDS)
- Setting
- The following items are charged to me for this talk.
 1. Allowance of W mask thickness to protect ECL from backgrounds.
 2. Neutron background from beam dump.
 3. Vacuum vs. backgrounds



Simulation tool (LCBDS)

LCBDS

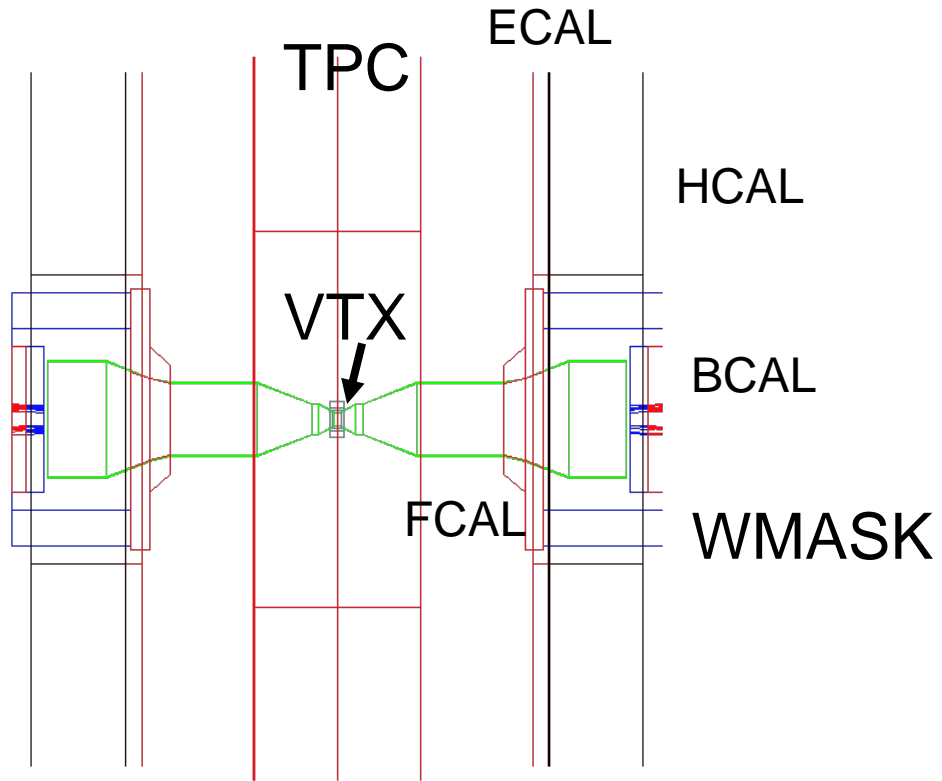
- Beam line full simulation program based on GEANT4 (+root).
- Beam line geometry is given by parameter file (no hard coding). →SAD parameter file can be transferred to the file.
- CAIN output file can be used to generate events.
- Good user's guide (160pages)



Excuses

- We can not find out the some of latest important parameters according to 14mrad crossing angle.
 - Beam line geometries (incoming and extraction)
 - DID
 - ...

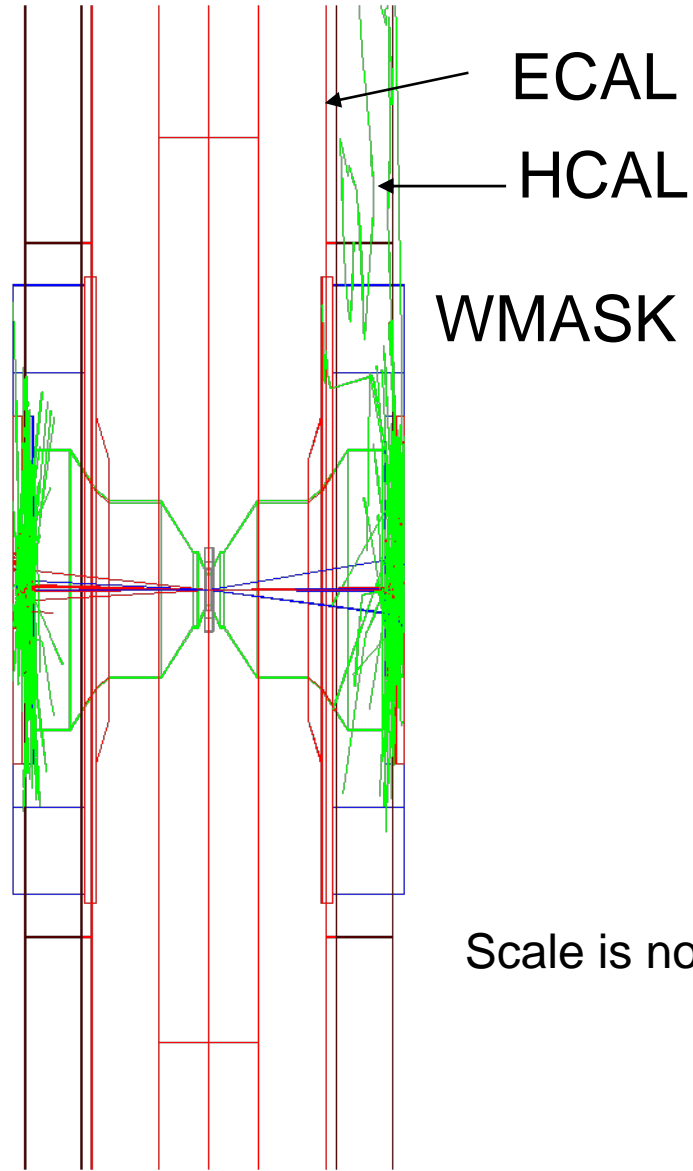
GLD detector model



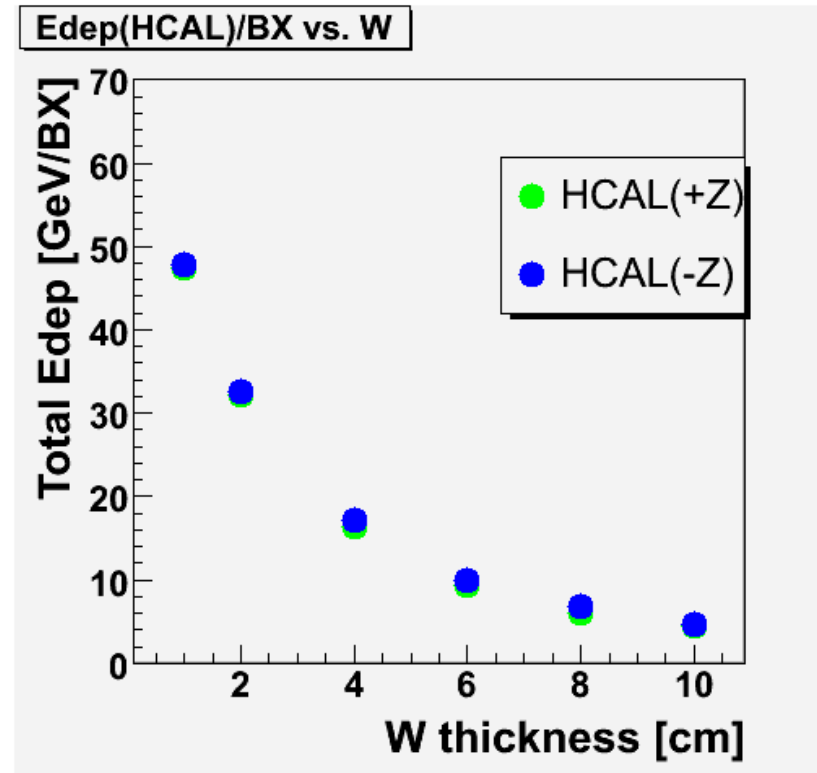
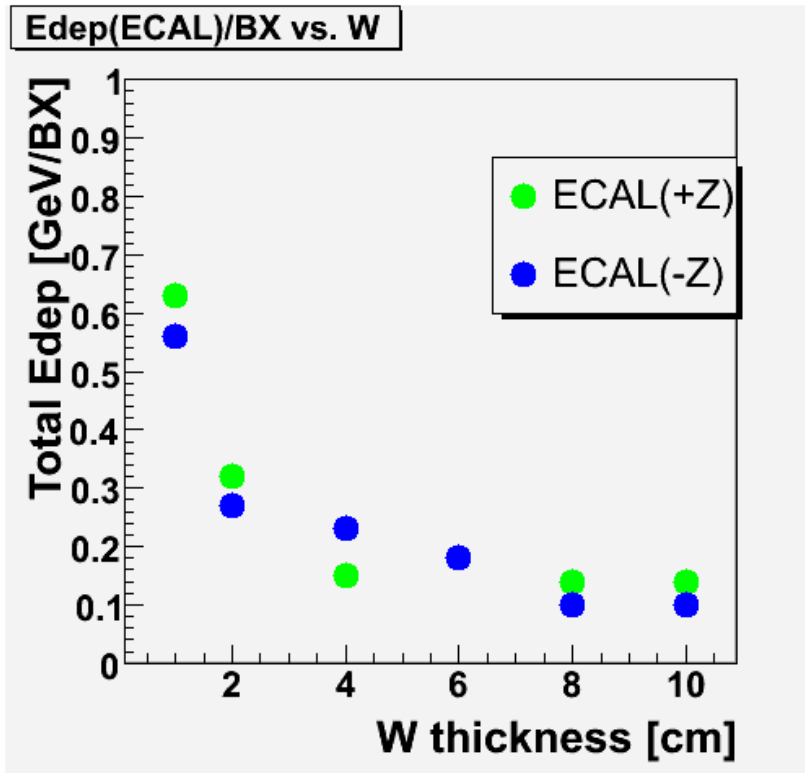
Scale is not conserved

Pairs event display

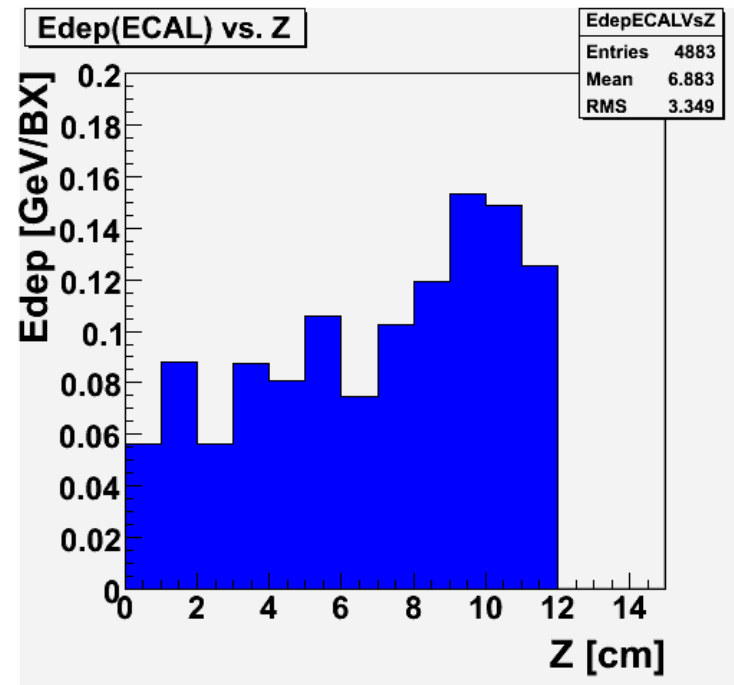
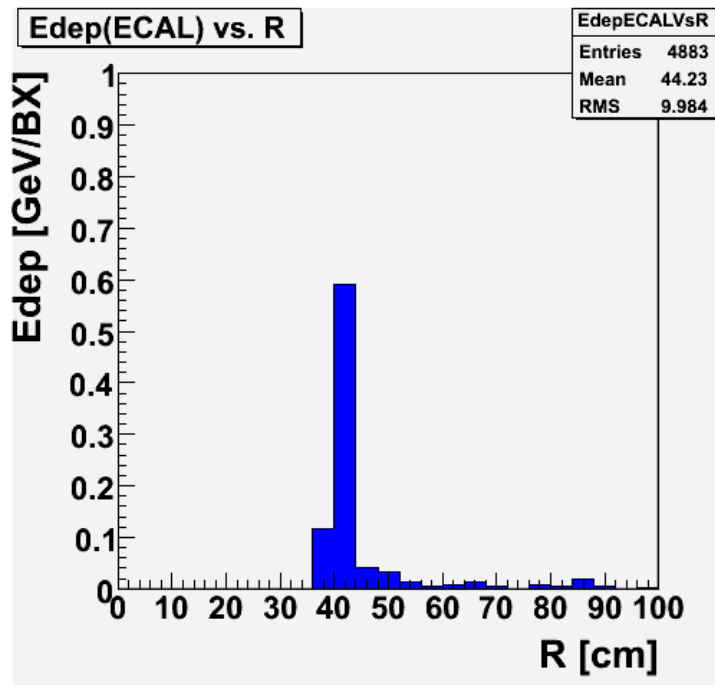
Can WMASK
protect ECAL and
HCAL from
backgrounds?



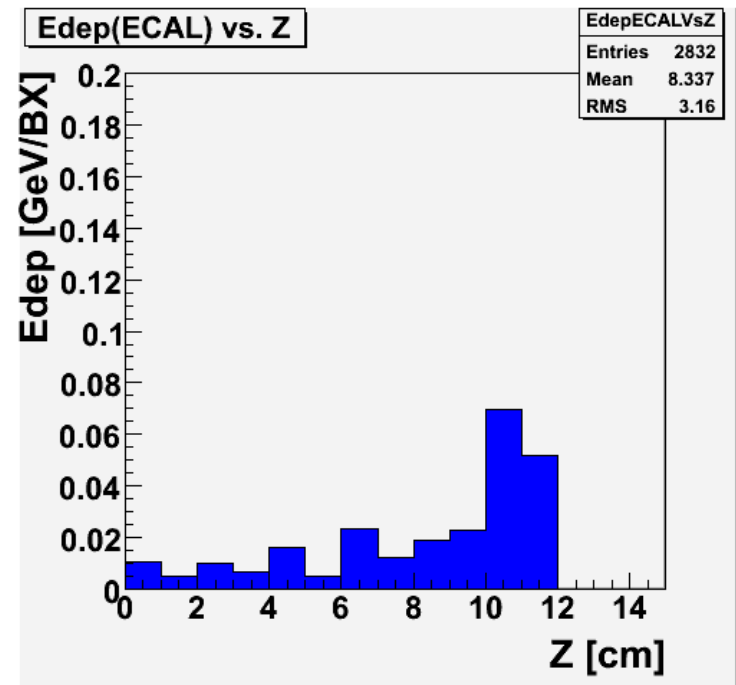
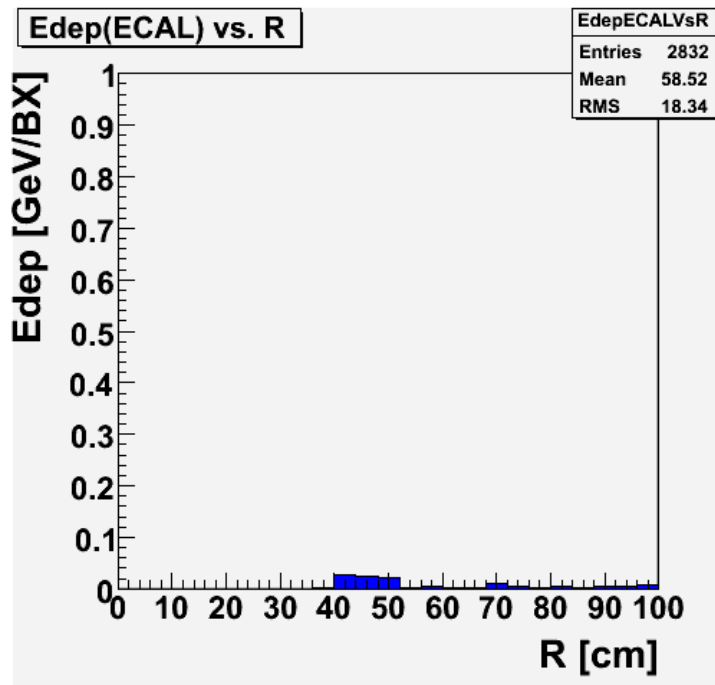
Deposit energy vs. W thickness



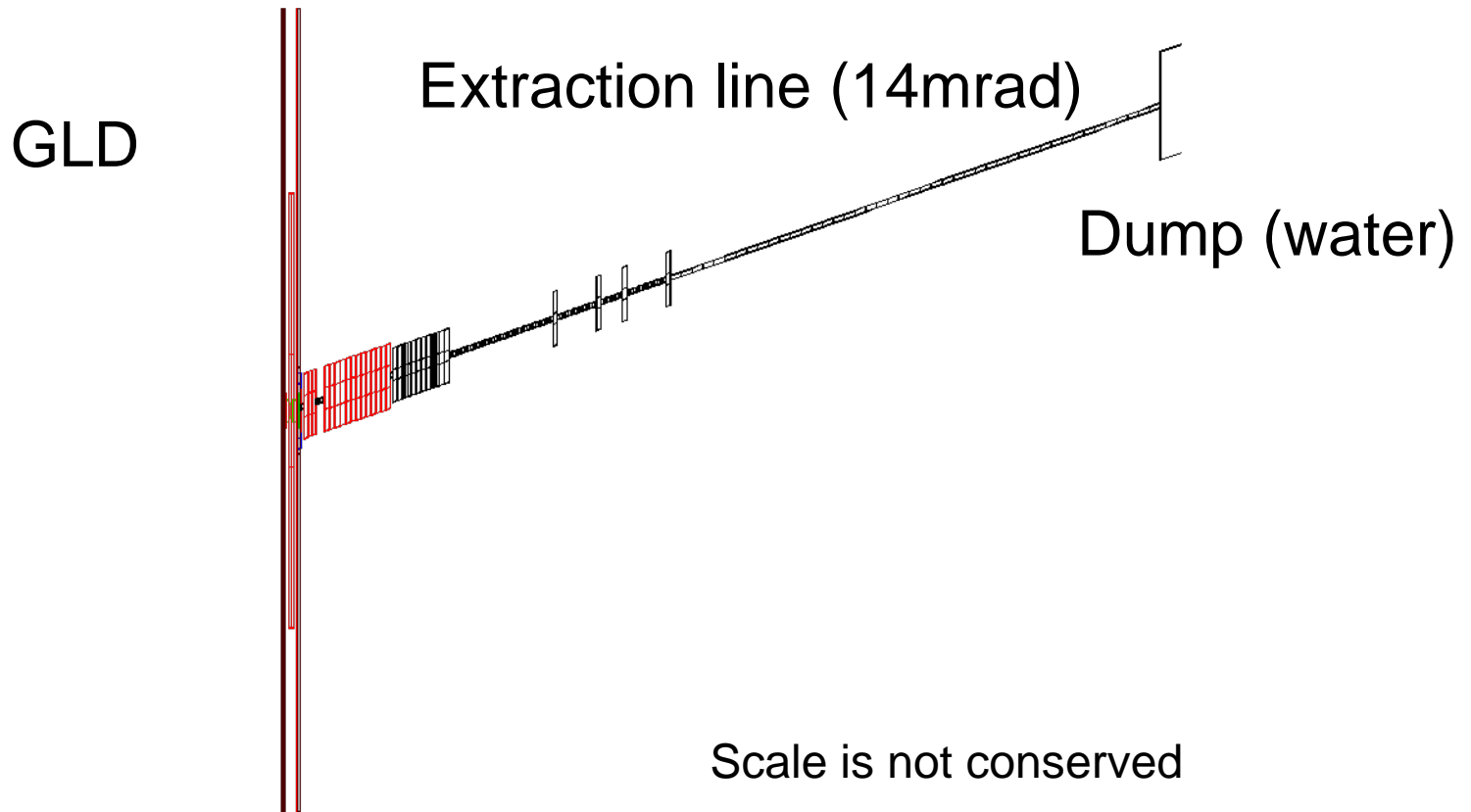
Pairs Edep(ECAL) Wthick=1.0cm



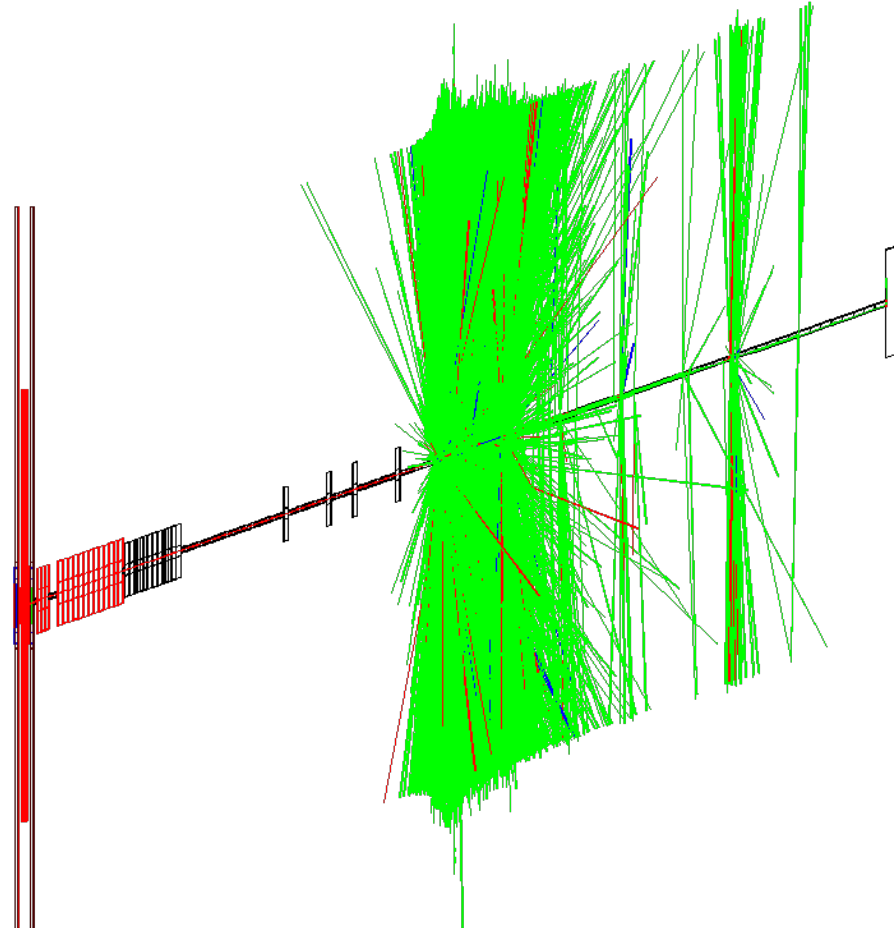
Pairs Edep(ECAL) Wthick=10cm



● ● ● | GLD + Extraction beam line



● ● ● | Disaster...



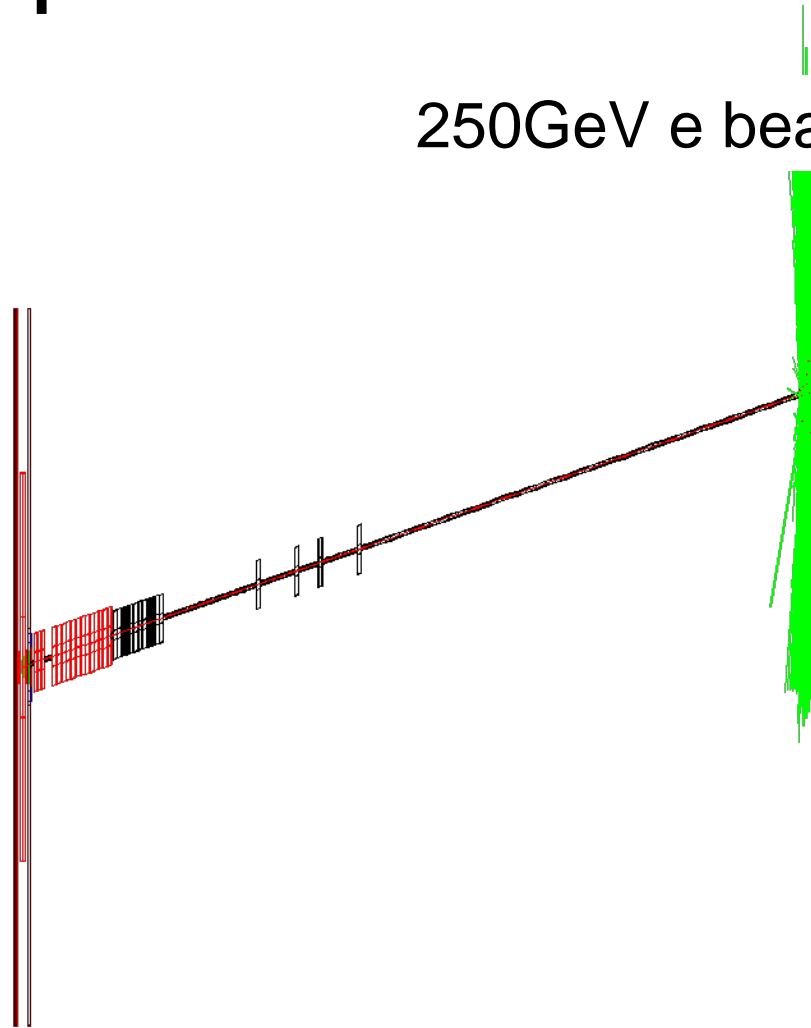
250GeV e beam can not pass through the extraction line
→ We do not have right anti-DID field now.



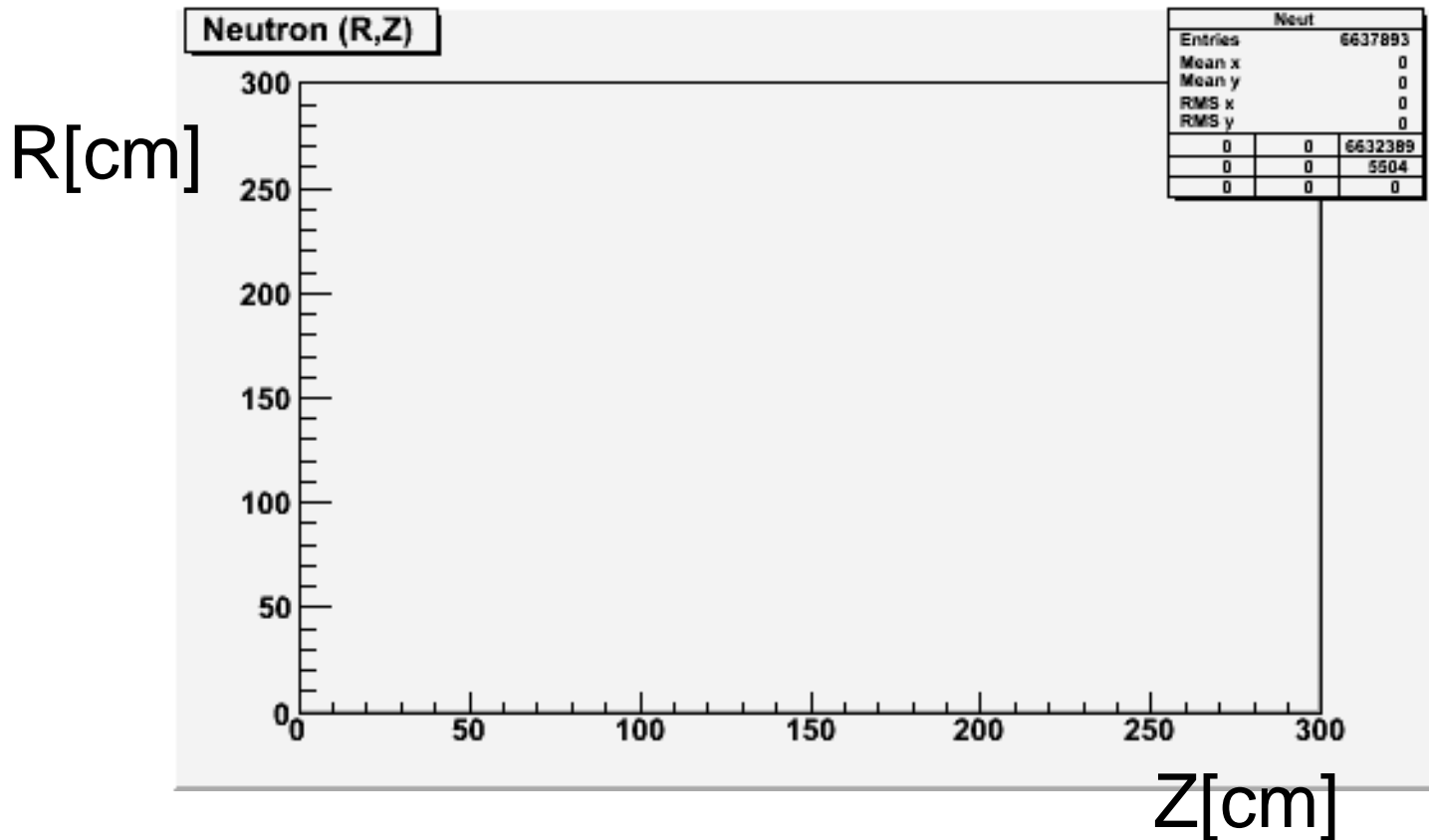
Temporal fix

250GeV e beam reaches dump.

No GLD B field.



Backscattered neutron in tracker



We can not see any neutrons with 200,000 events.

→ We need more statistics or inflated neutron production.



Vacuum vs. backgrounds

- We study it by applying 1000Pa in IR to save CPU time and scaling it assuming linear relation between vacuum pressure and background amounts.
- We take care of the interaction between beamstrahlung and gas.



Vacuum vs. BKG / BX

Detector	10^{-7}Pa	10^{-6}Pa
BCAL	0.6GeV	6GeV
Vertex (first layer)	$2 \times 10^{-7}\text{GeV}$	$2 \times 10^{-6}\text{GeV}$
TPC	$7 \times 10^{-8}\text{GeV}$	$7 \times 10^{-7}\text{GeV}$
Endcap ECL	$3 \times 10^{-5}\text{GeV}$	$3 \times 10^{-4}\text{GeV}$
Endcap HCAL	$3 \times 10^{-4}\text{GeV}$	$3 \times 10^{-3}\text{GeV}$



Summary

- Today we show prompt background studies.
- The studies show some results.
- We need the latest parameters related to beam line, MDI, ..., for further understanding of background efforts.