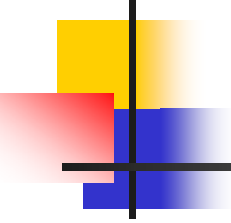


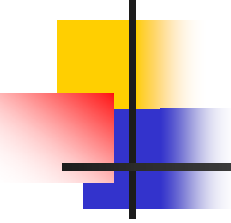
LCBDS simulation studies on SiD and GLD

Aihara group
University of Tokyo



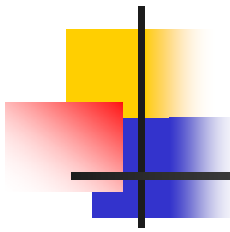
Introduction

- We have developed beam simulation program, LCBDS.
- Our objective for Snowmass is to deliver studies of backgrounds on SiD and GLD with 2mrad and 20mrad crossing angle configuration.



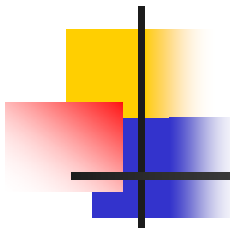
Contents of this talk

- Outline of LCBDS
- Background studies
 - Pairs
- Summary



Outline of LCBDS

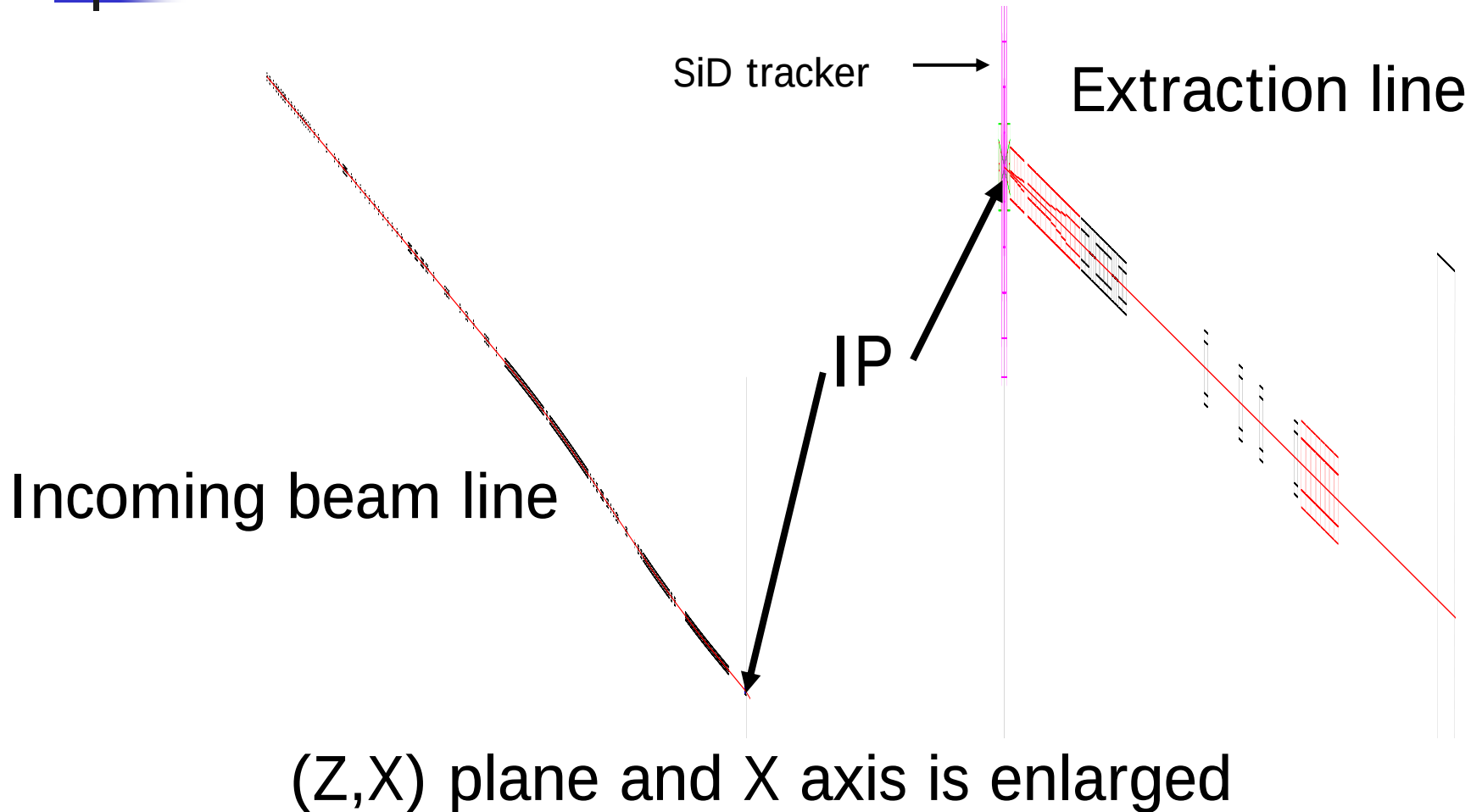
- LCBDS is based on GEANT4 working on Linux and Windows.
- Detector geometry is given by text file with similar parameterization to SAD.
(we are working on making program to convert SAD input file to LCBDS geometry file)
- CAIN output file (pairs,...) can be used to generate events.



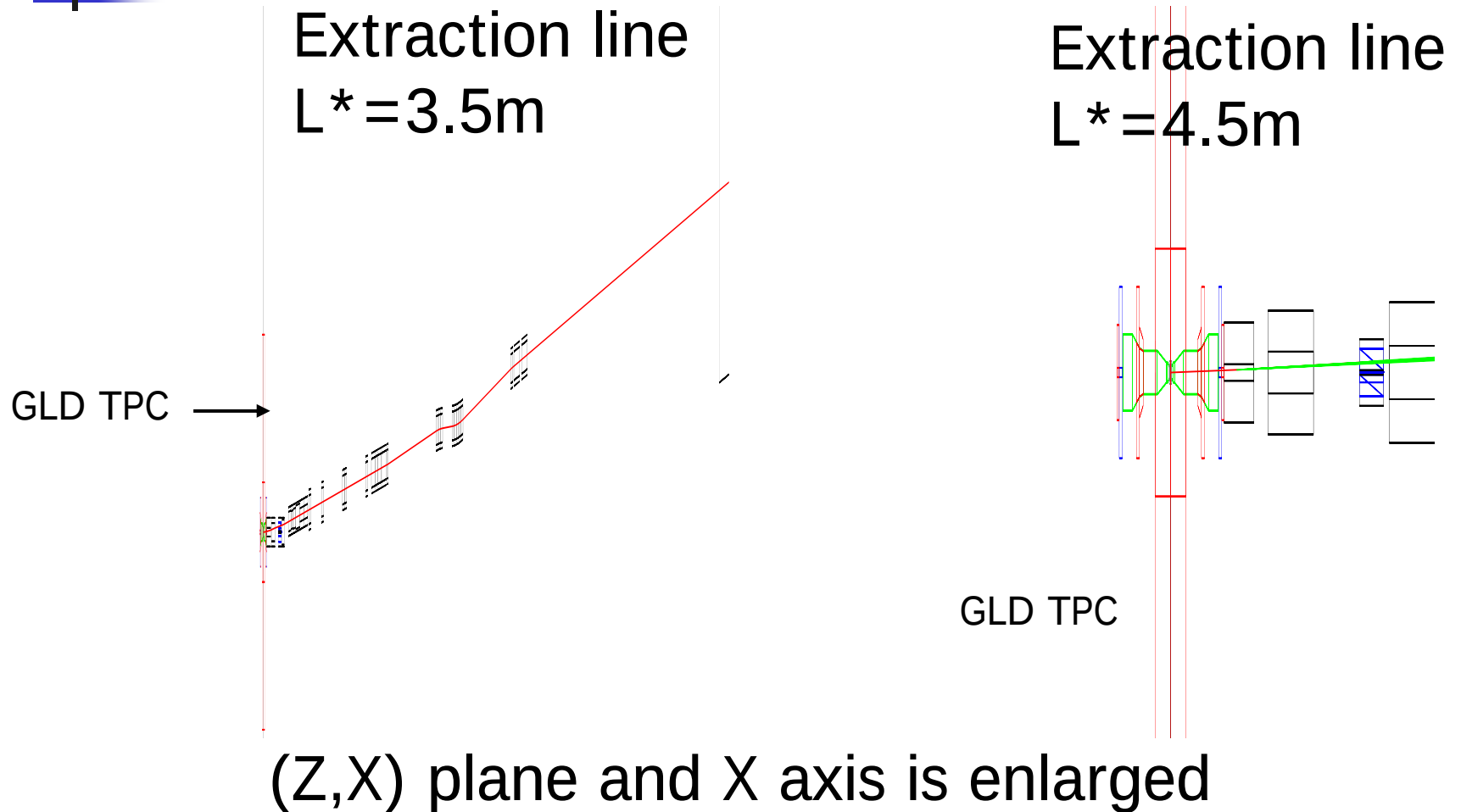
Beam line geometry for Snowmass

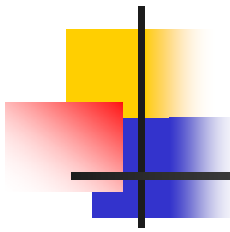
- We have implemented 20mrad and 2mrad beam line geometry with help by Takashi, Andre and Mike.
- Special steppers in magnets are implemented as an option. (thanks to courtesy help by G.A. Blair)
- Straw man type of detector geometry is also implemented for VTX and tracker. (but no support materials, no calorimeters and so on)

20mrad beam line with LCBDS



2mrad beam line with LCBDS



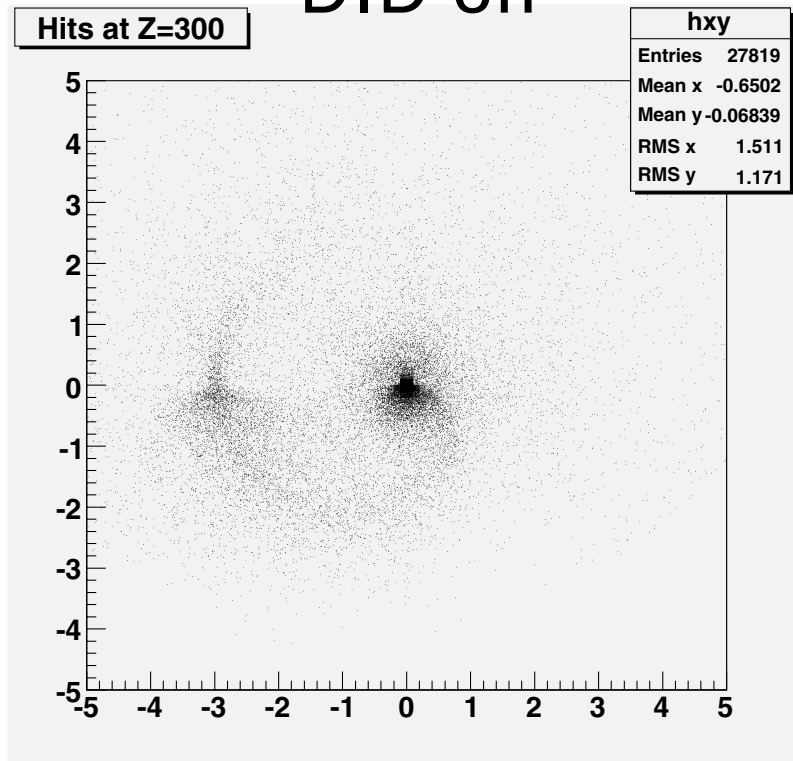


Background studies

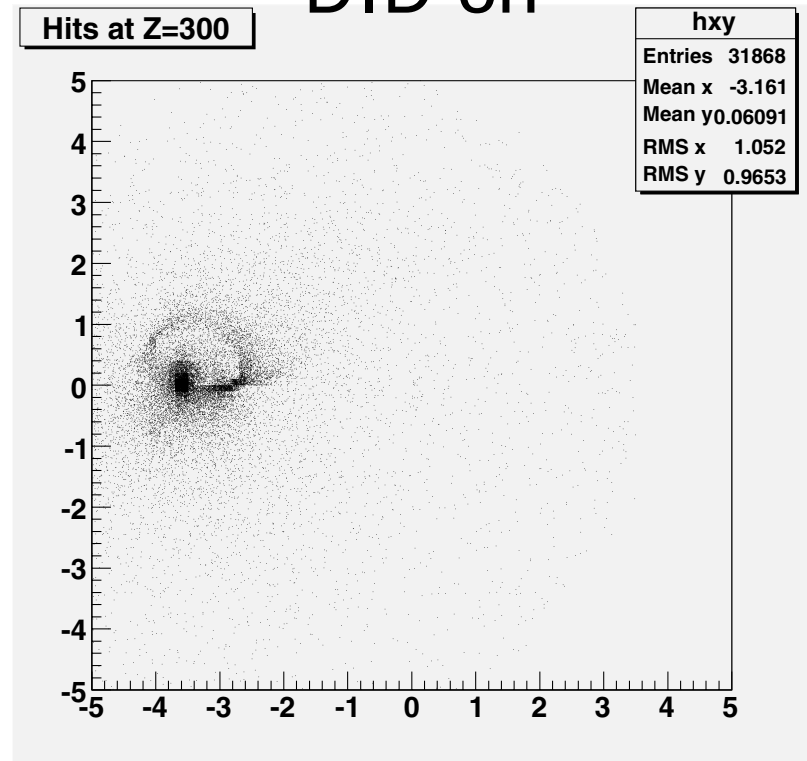
- We follow Takashi's study presented on the last June at ILC BDIR workshop.
- Beam parameters: ILC 500GeV nominal.
- Pairs background is generated with CAIN.

Pairs at $Z = 300\text{cm}$ (GLD, 20mrad)

DID off



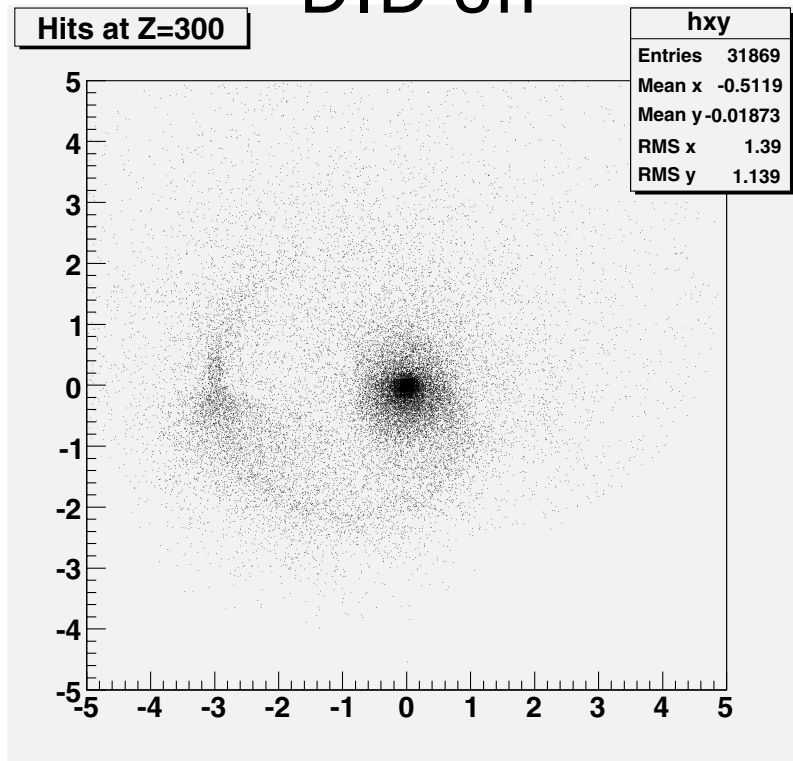
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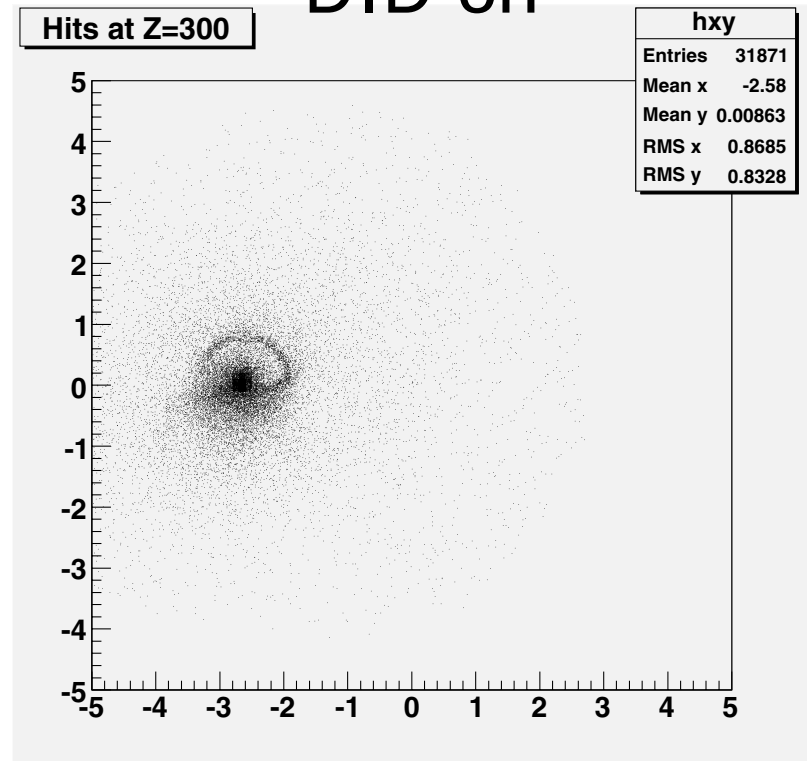
$B=3\text{T}$

Pairs at $Z=300\text{cm}$ (SiD, 20mrad)

DID off



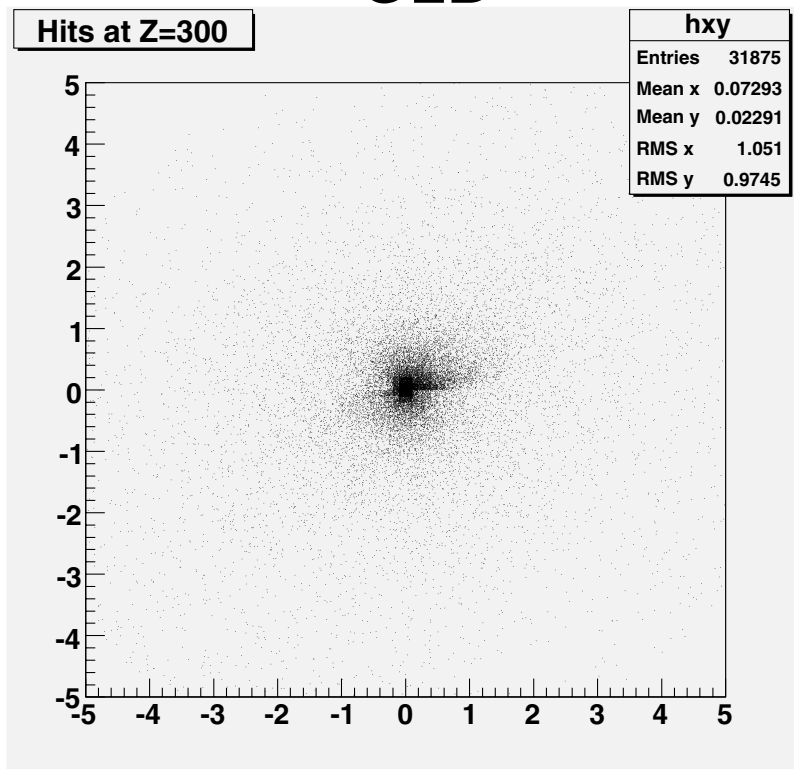
DID on



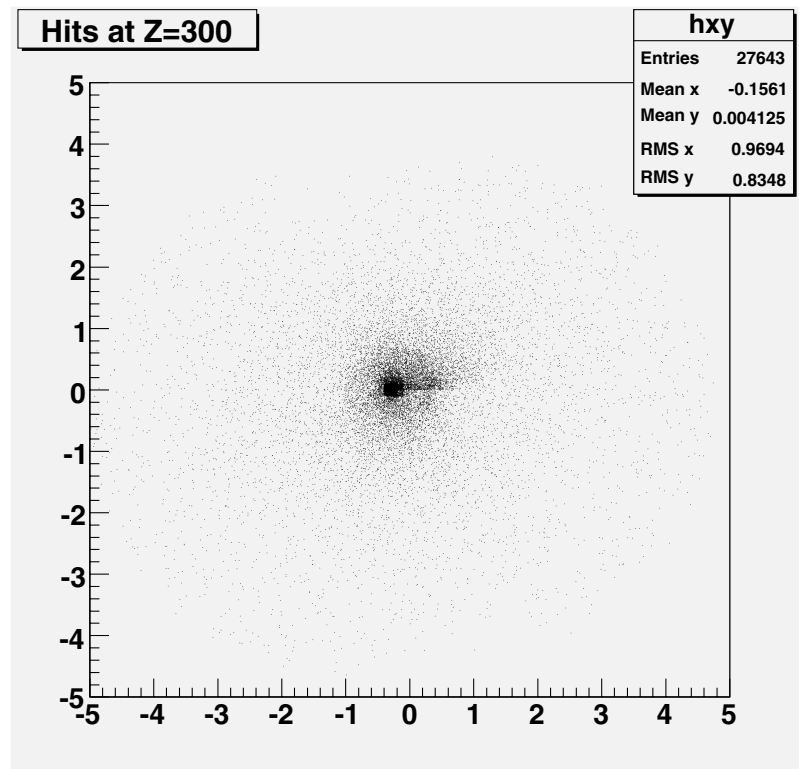
$B=5\text{T}$

Pairs at $Z = 300\text{cm}$ (2mrad)

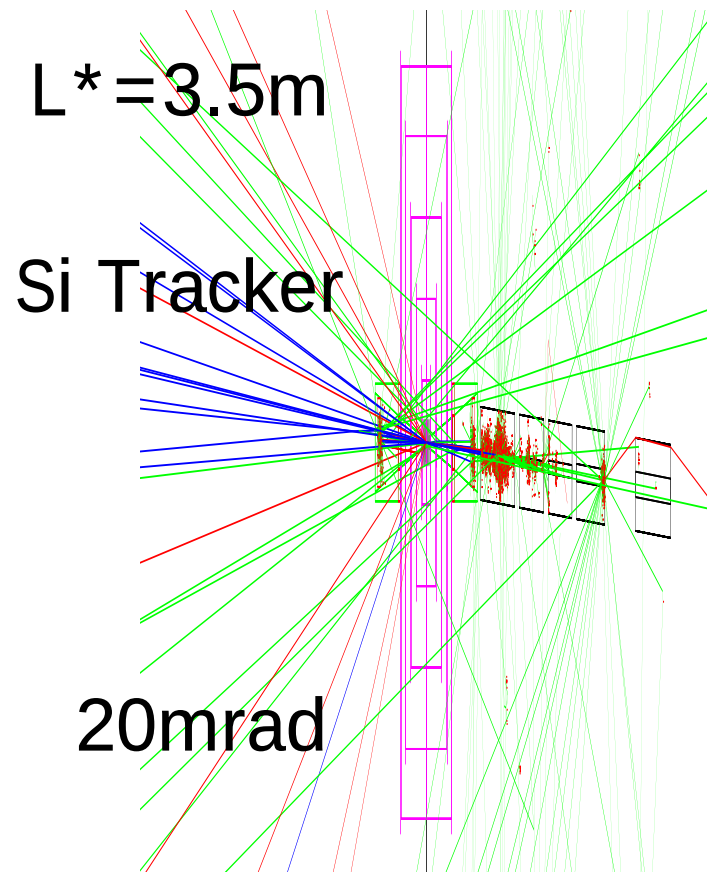
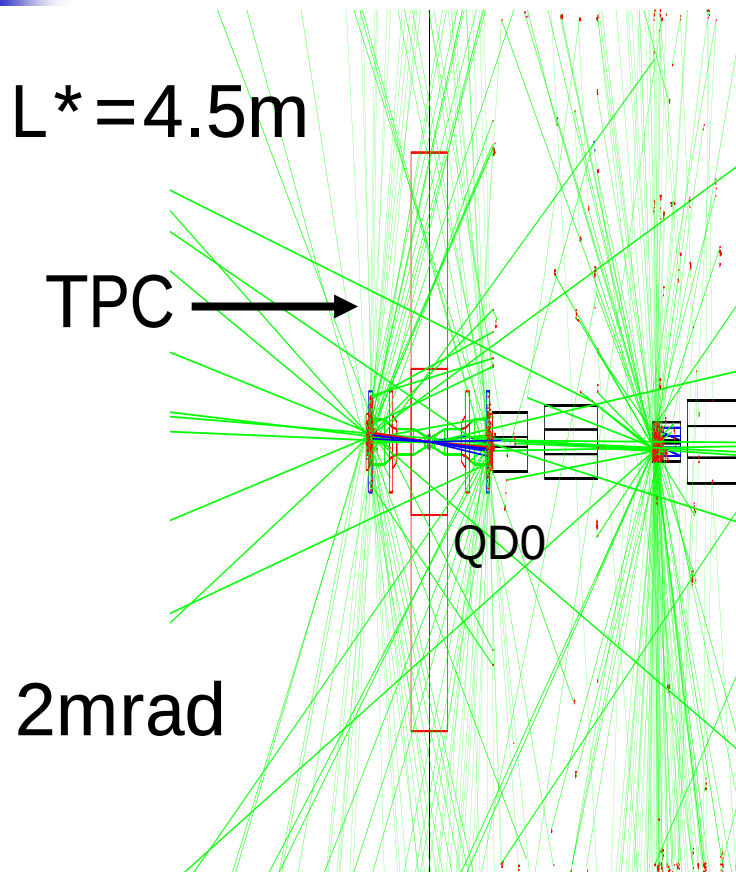
GLD



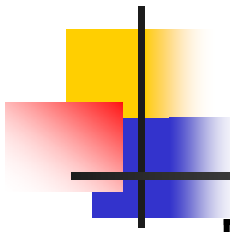
SiD



Pairs



Backscattering effect to the detector?

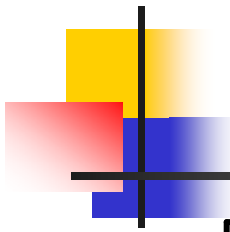


Pairs in 2mrad (cont.)

	GLD	SiD	SiD(Takashi)
BCAL	17mW	13mW	29mW
QD0	94mW	97mW	147mW
SD0	11mW	11mW	11mW
QF1	16mW	18mW	15mW
SF1	0.4mW	0.3mW	1mW

One side

Two side?

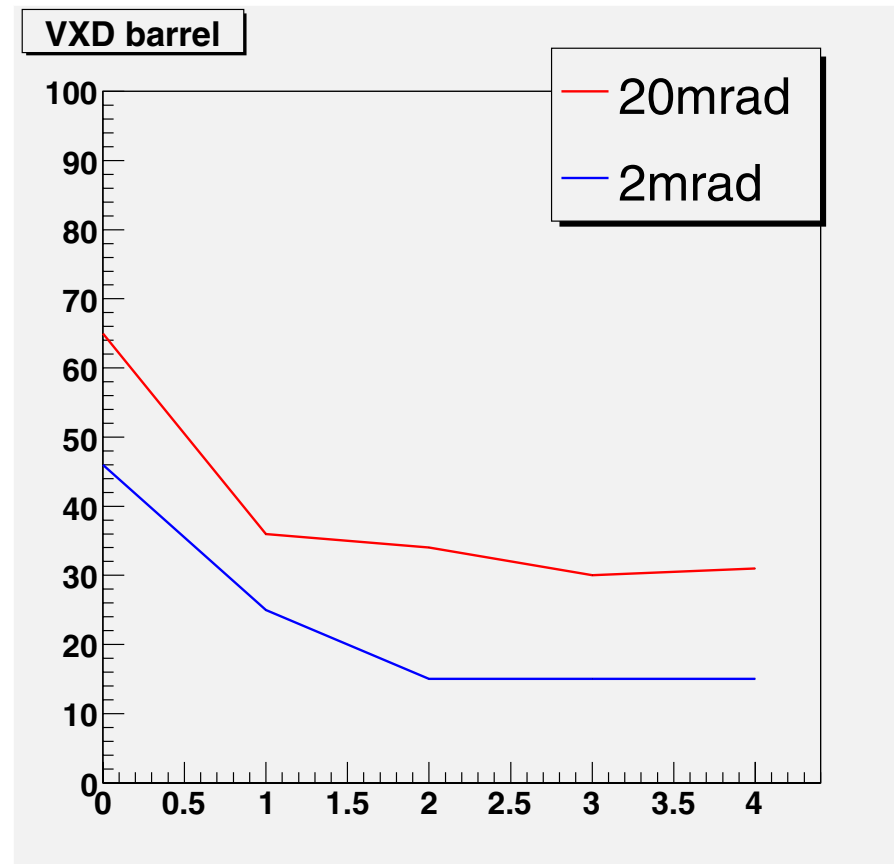


Pairs in 20mrad (one side)

	GLD (DID on)	SiD (DID on)	SiD (Takashi)
BCAL	31mW	20mW	72mW
1 st QDEX	43mW	56mW	96mW(?)
1 st QFEX	4.6mW	4.5mW	14mW(?)

SiD barrel VXD hits from pairs

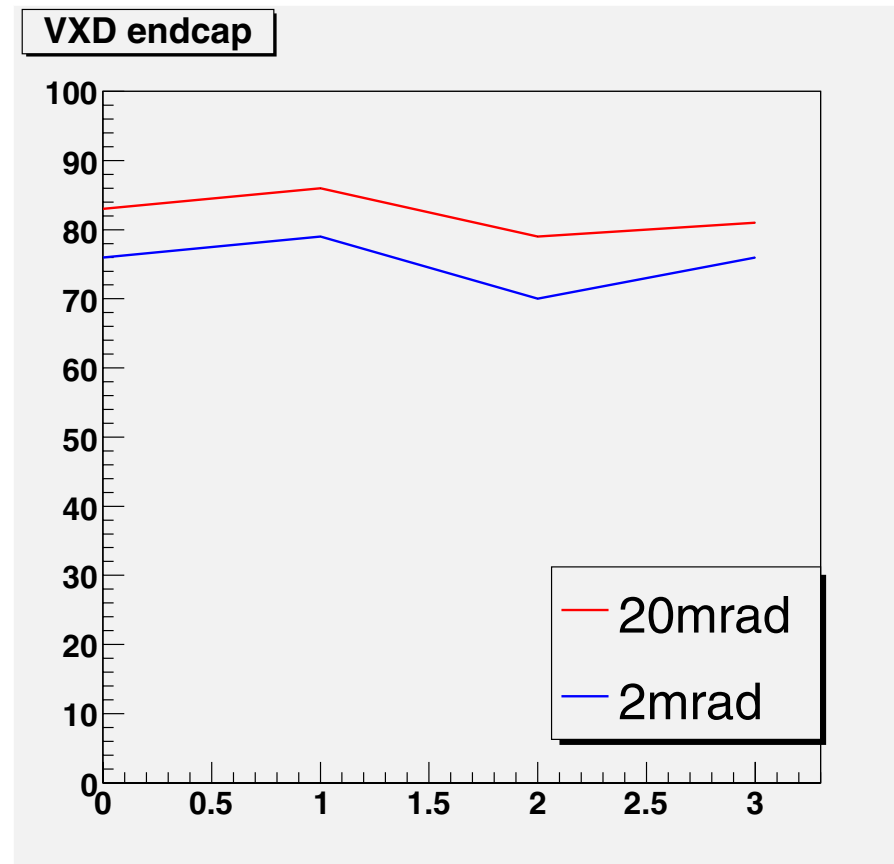
CAIN does not generate particles into barrel region, (Why?) so most of the hits by photons. (No energy cut)



1BX

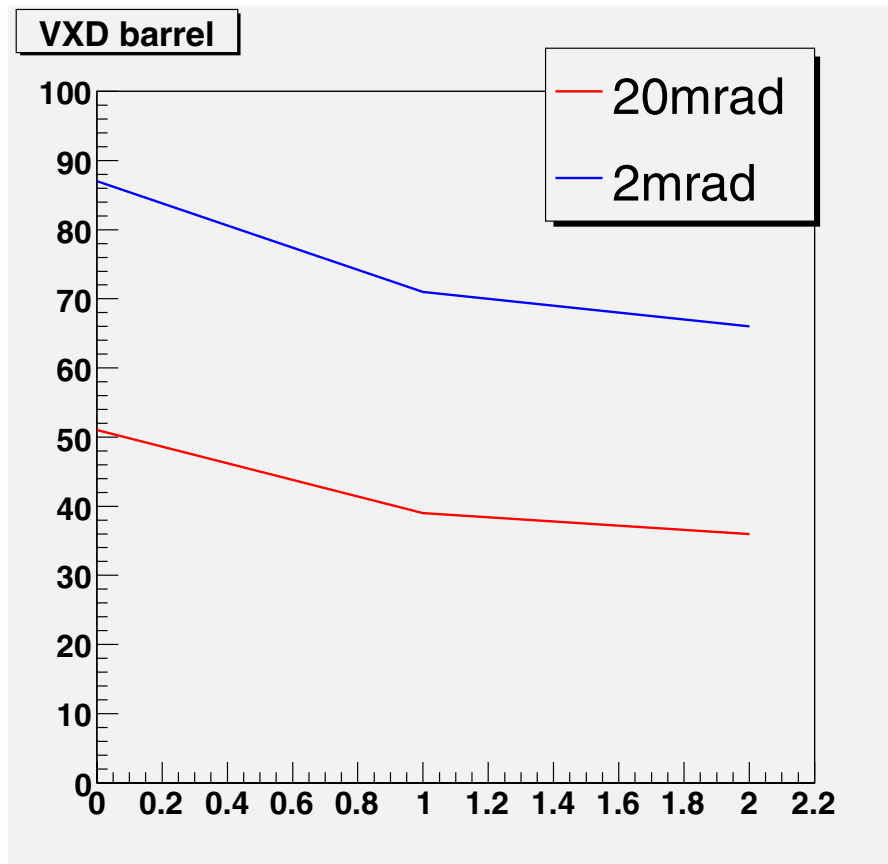
SiD endcap VXD hits from pairs

(No energy cut)



1BX

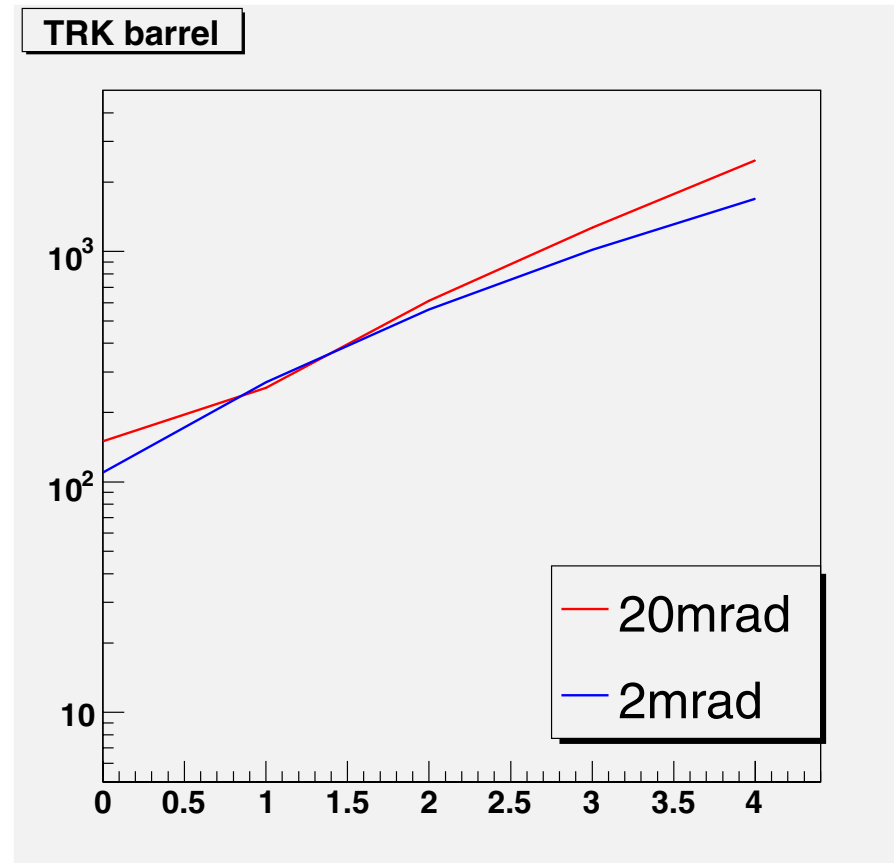
GLD VXD hits from pairs



1BX

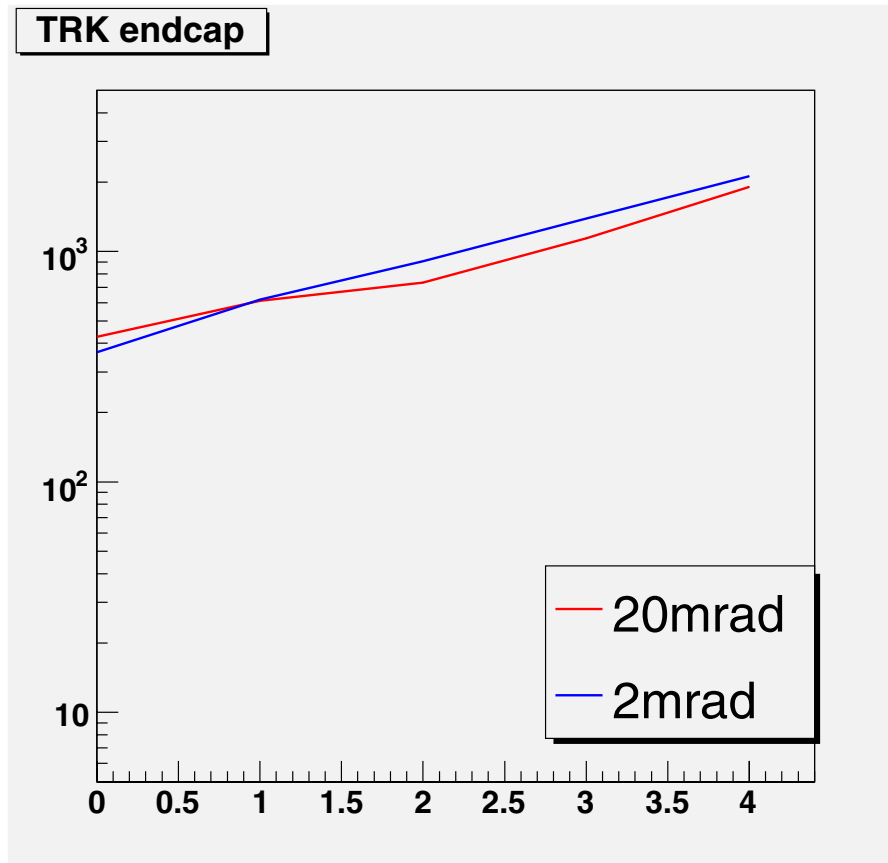
SiD barrel tracker hits from pairs

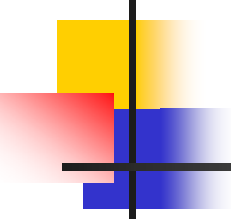
No energy cut and these hits must be by photons



SiD endcap tracker hits from pairs

No energy cut and these hits must be by photons



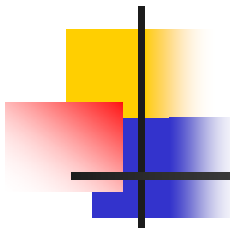


GLD TPC hits from pairs

- 20mrad
16820 hits

- 2mrad
12752 hits

(No energy cut, hits must be by photons)



Summary

- We have developed beam line simulation program, LCBDS.
- We have implemented 20mrad and 2mrad crossing angle beam delivery geometry.
- Quick study shows some results of backgrounds on SiD and GLD.