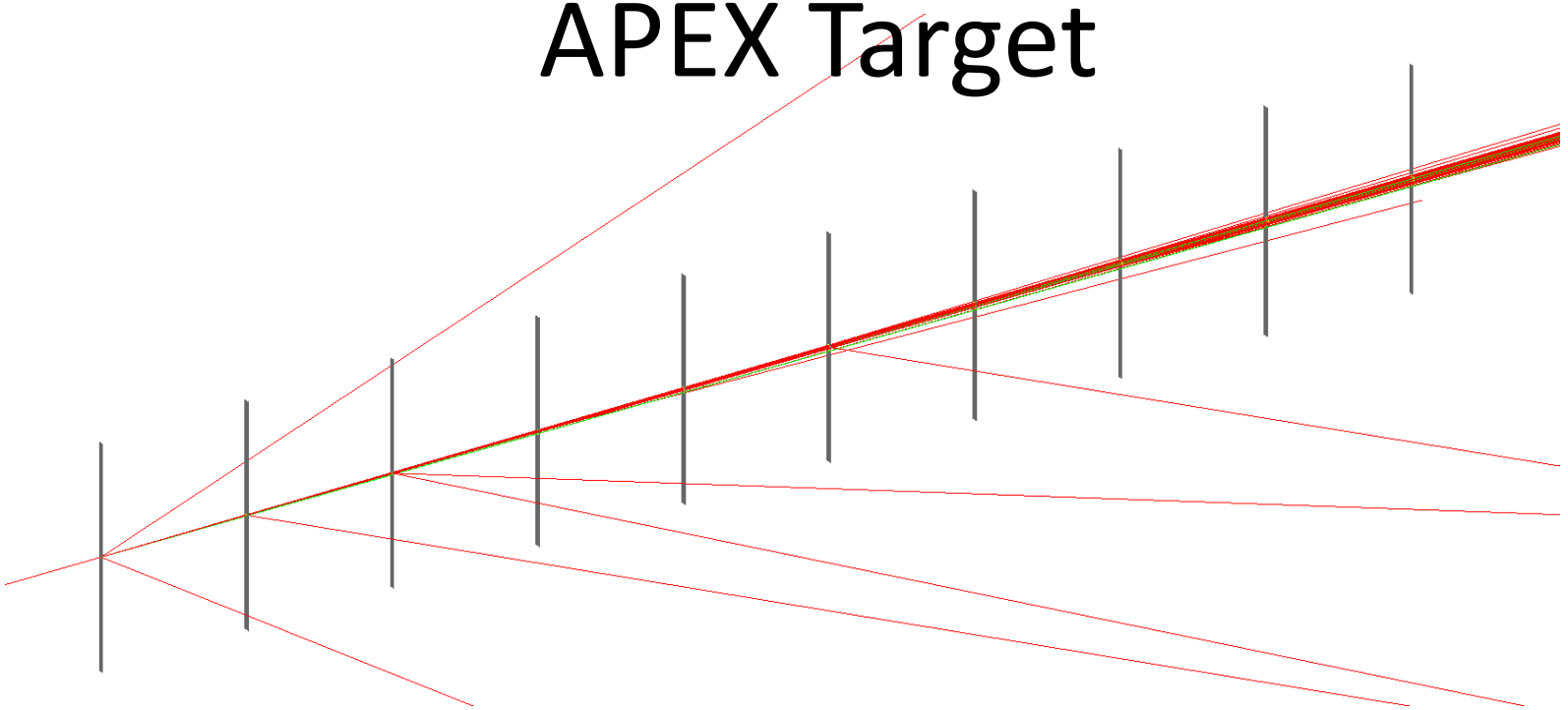
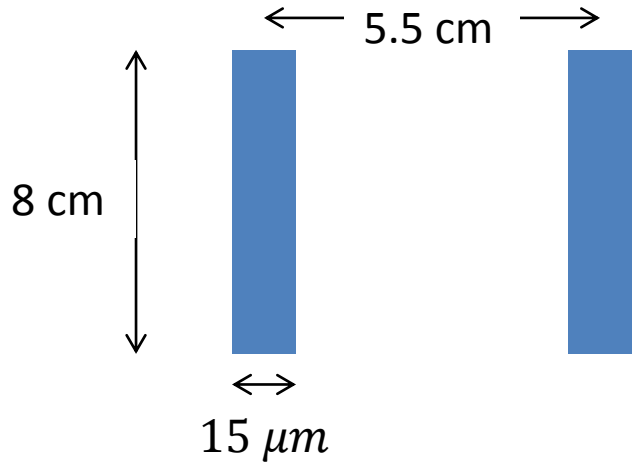
GEANT4 Simulation of background radiation study for APEX

Maduka Kaluarachchi

APEX Target

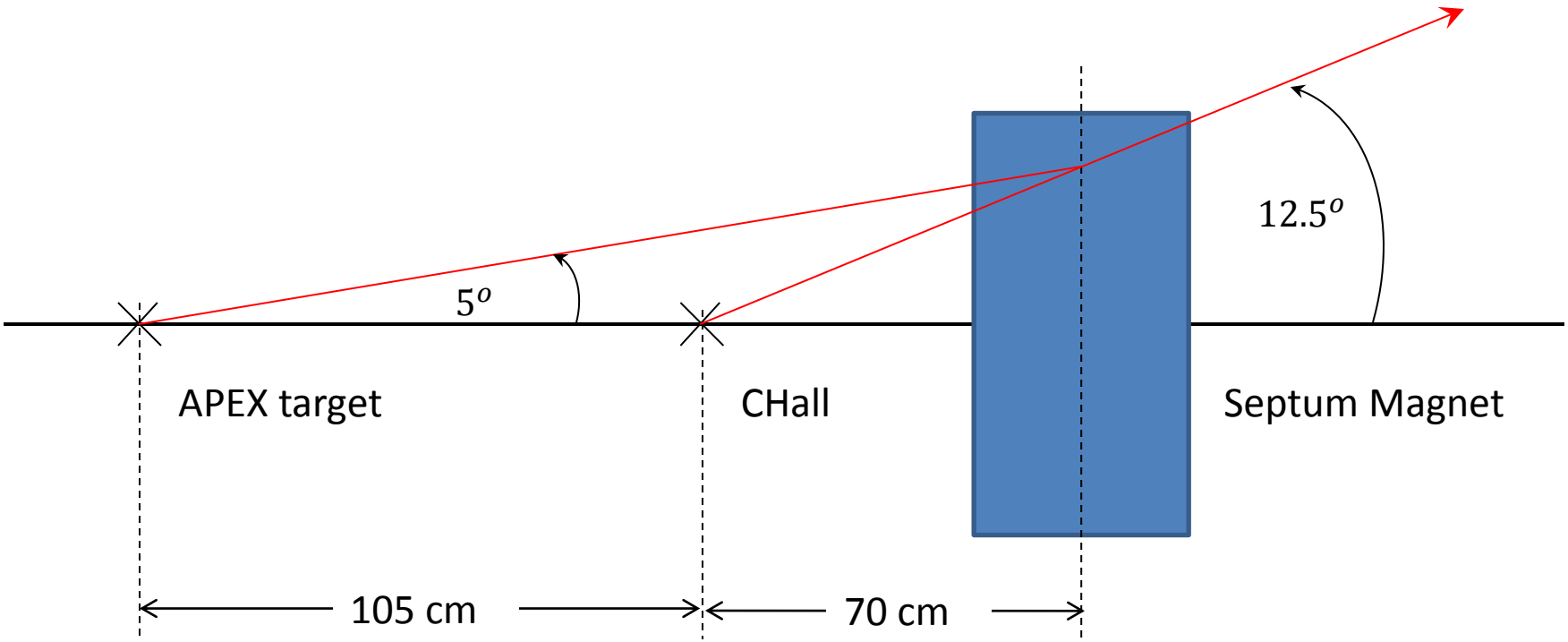




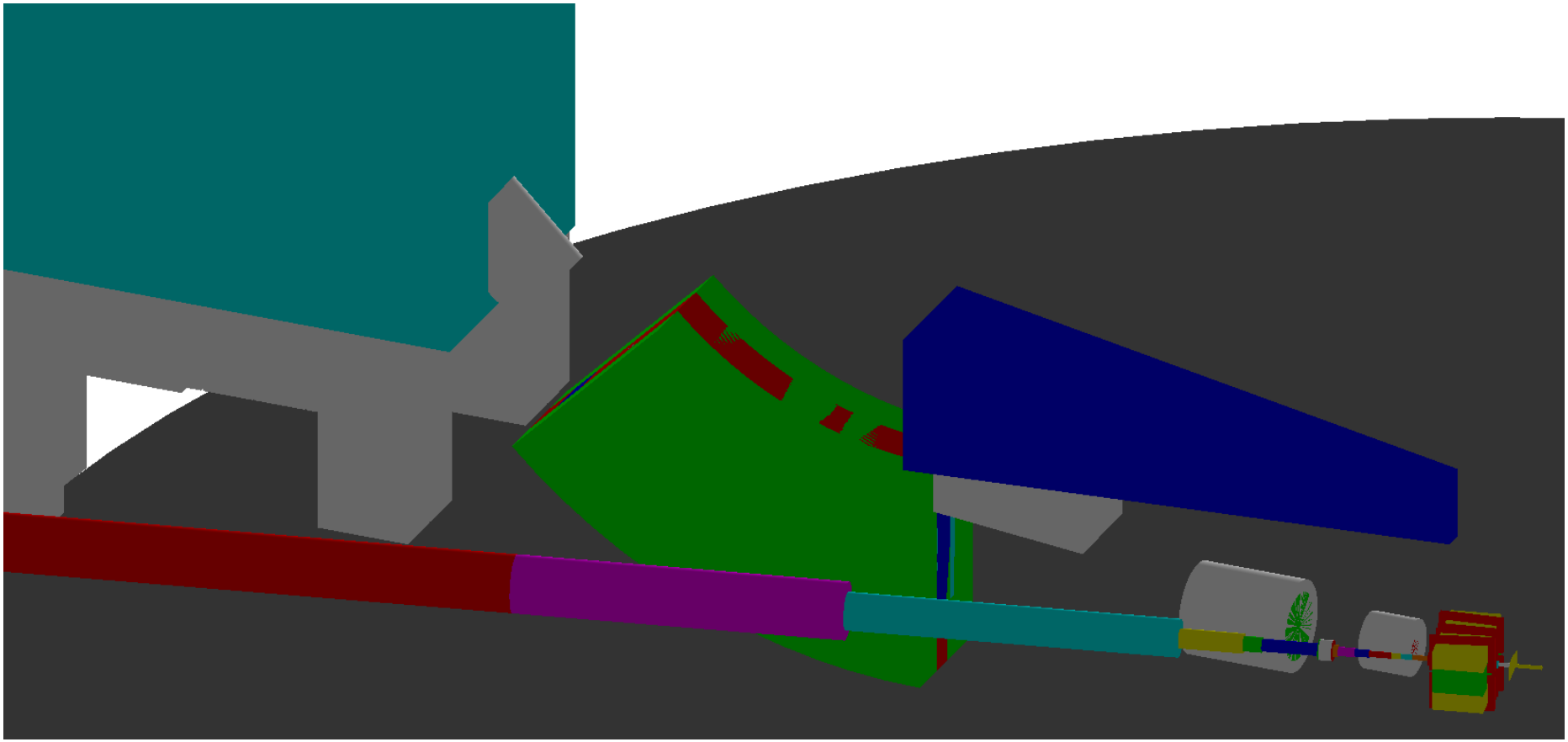
10 ribbons of Tungsten

$\mathbf{289\ mg/cm^2}$

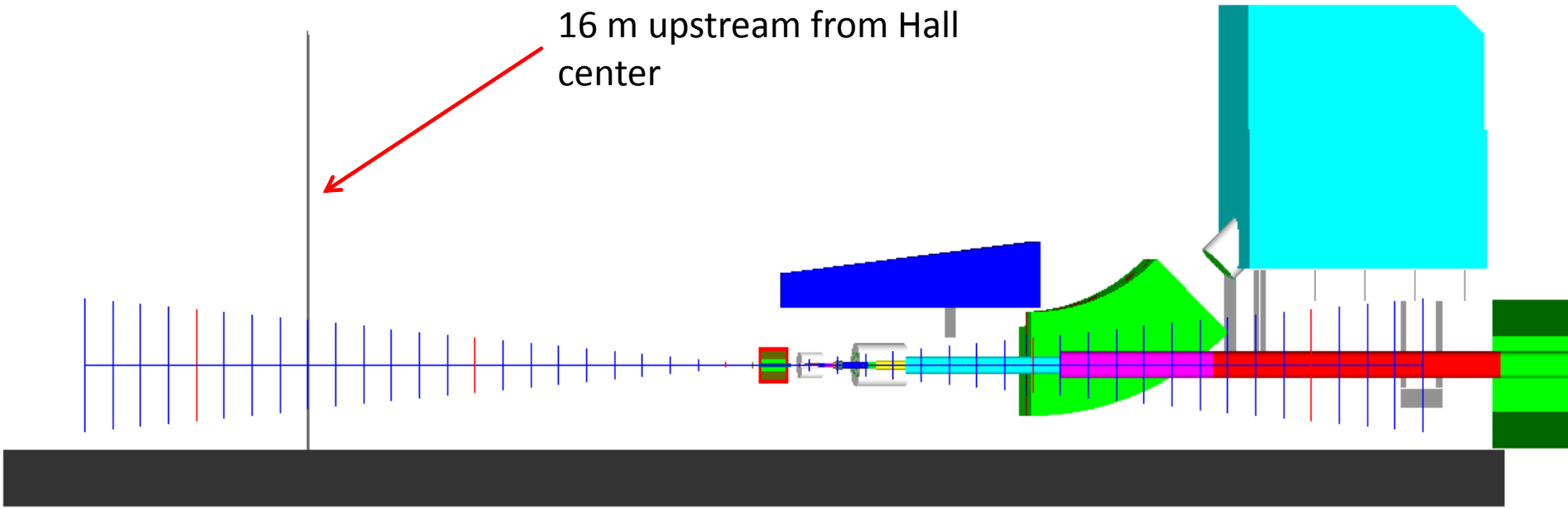
Target Position



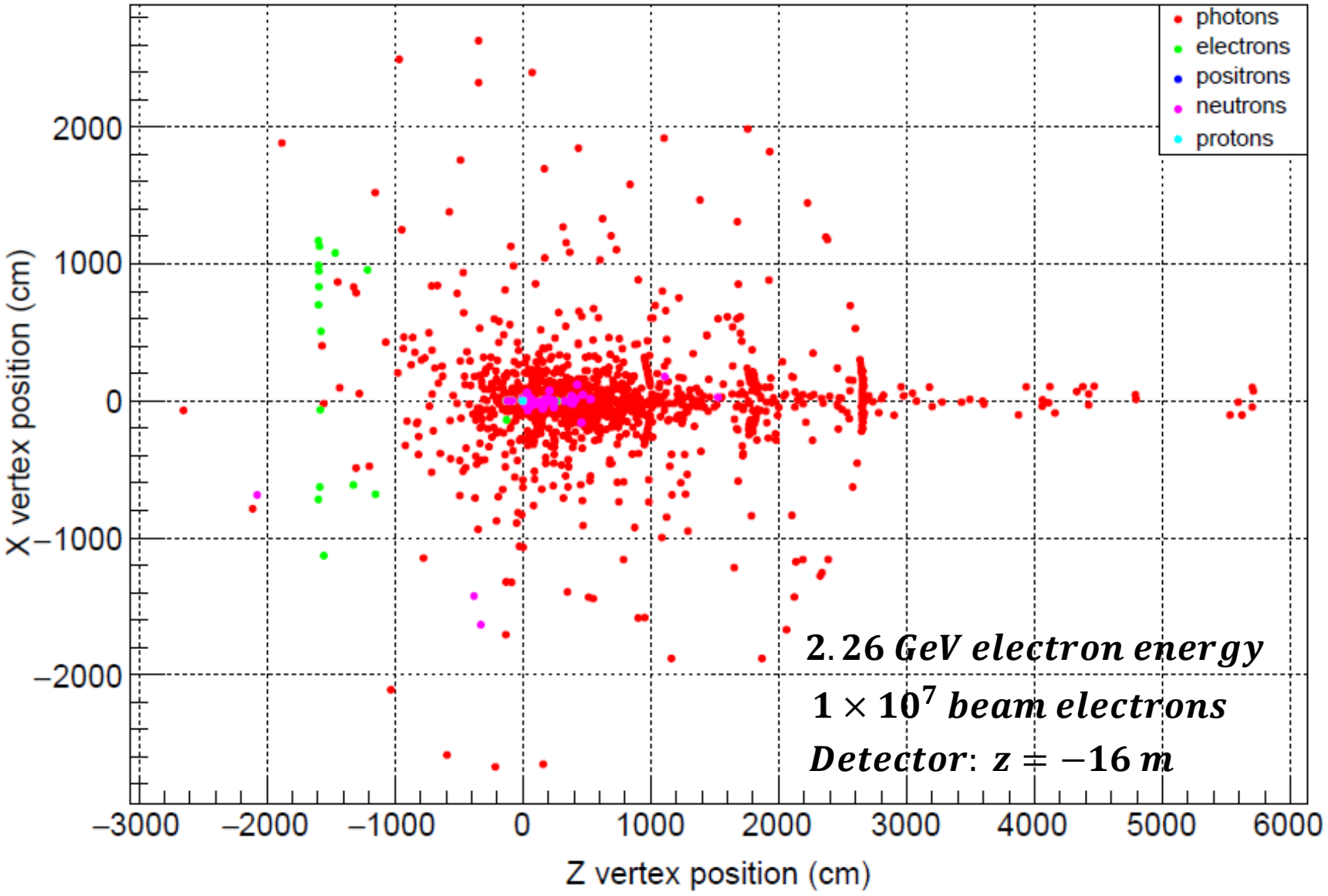
Hall A Geant4 description



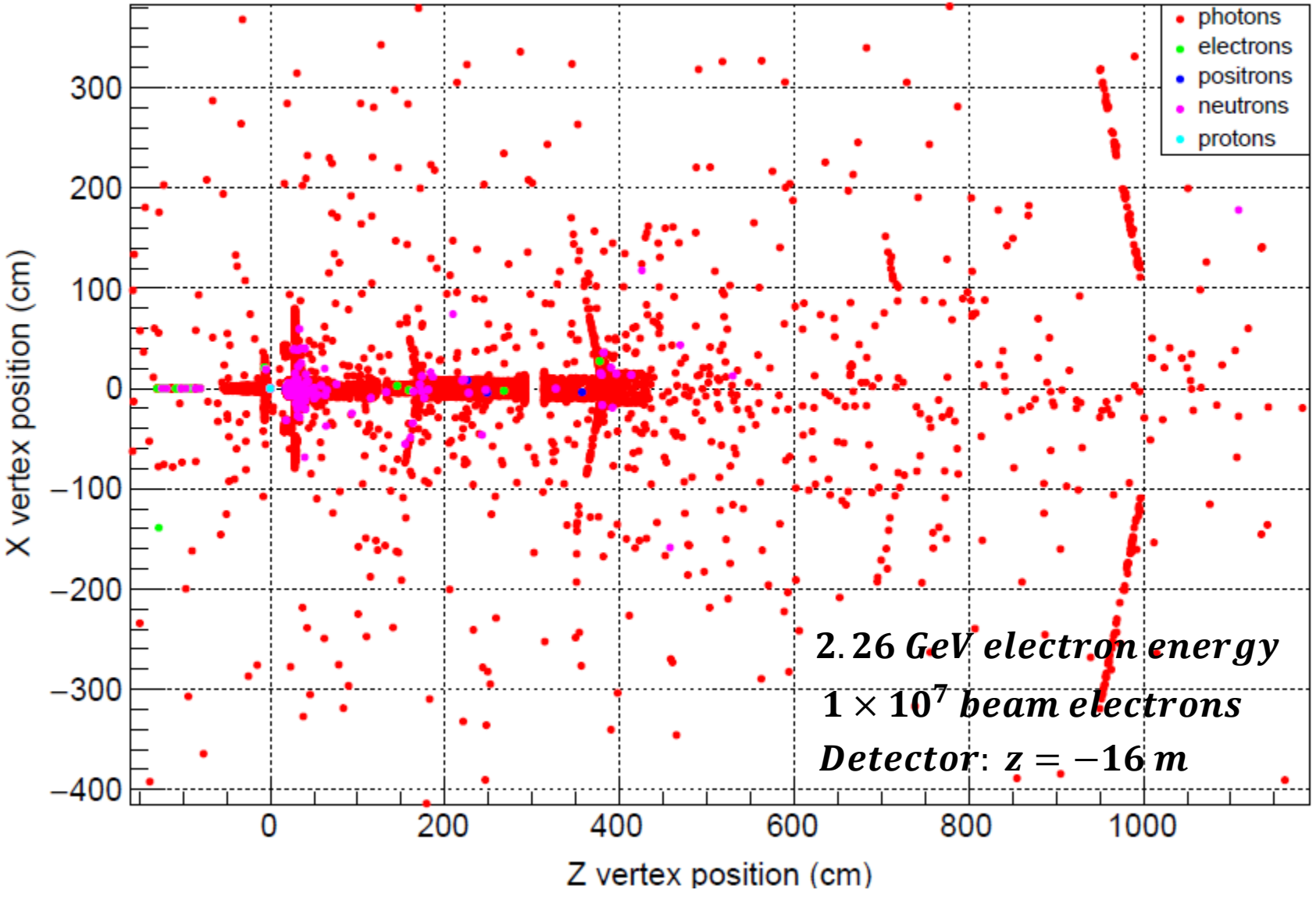
Position of Detector 1



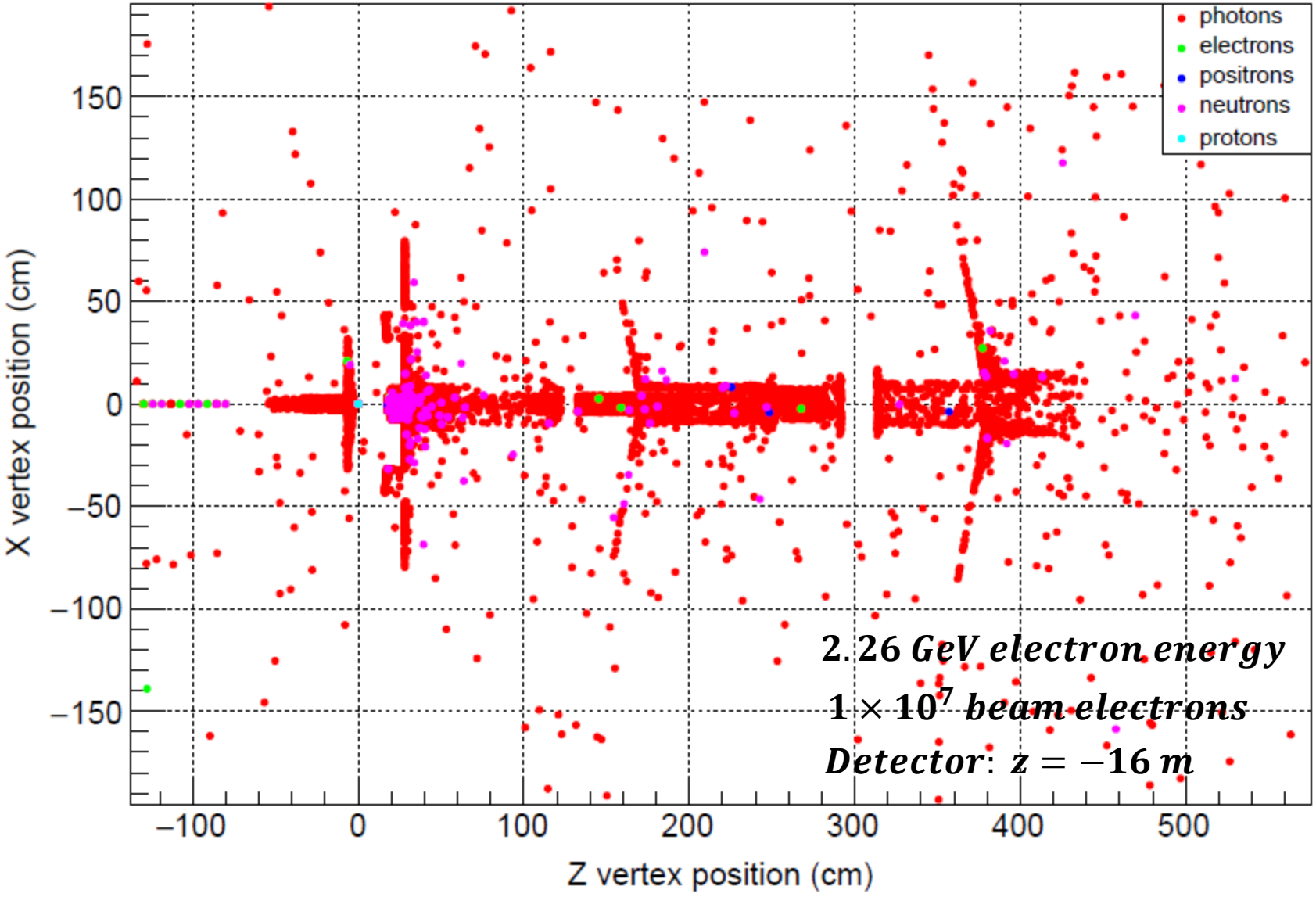
Distribution of energy sources in Hall-A



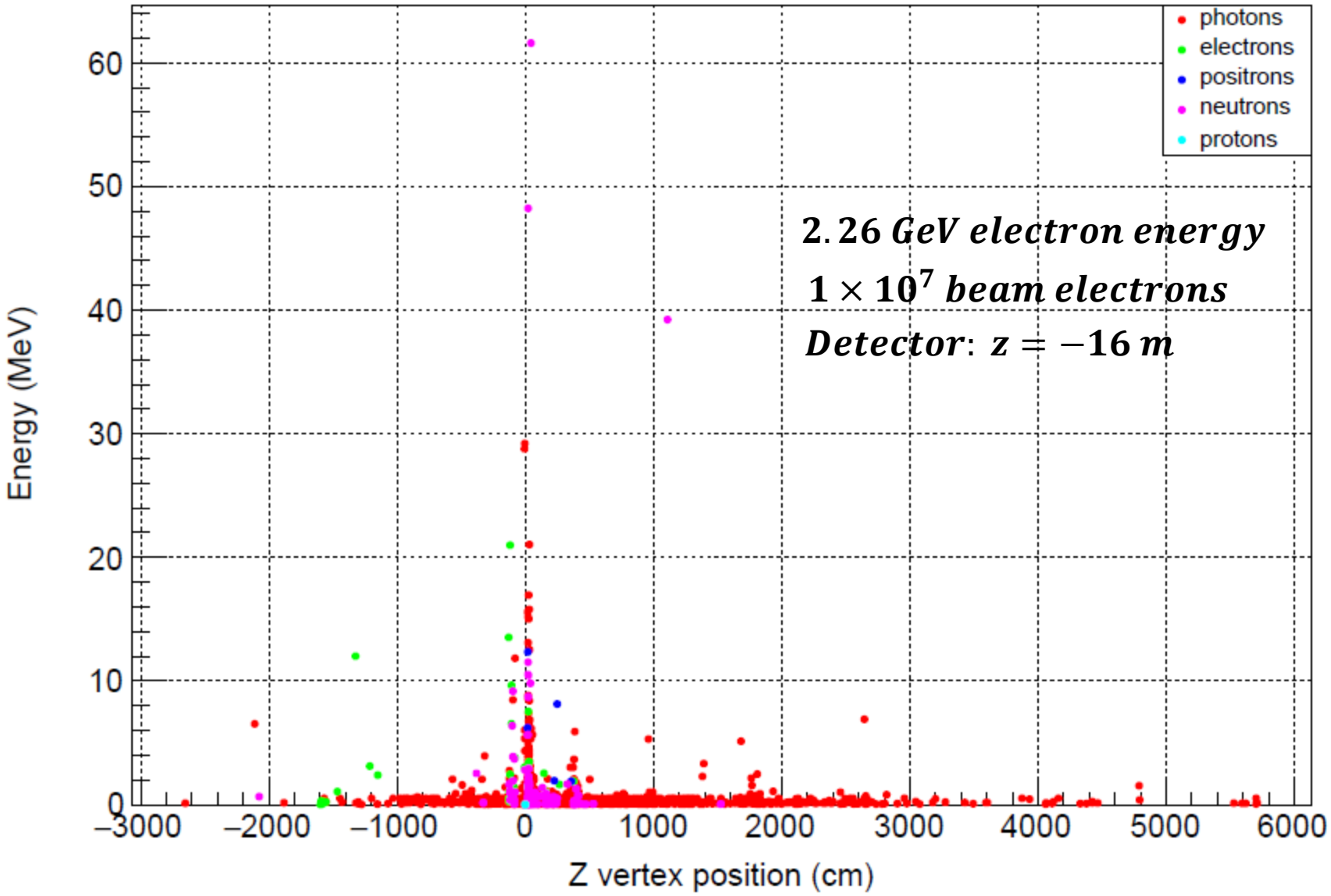
Distribution of energy sources in Hall-A



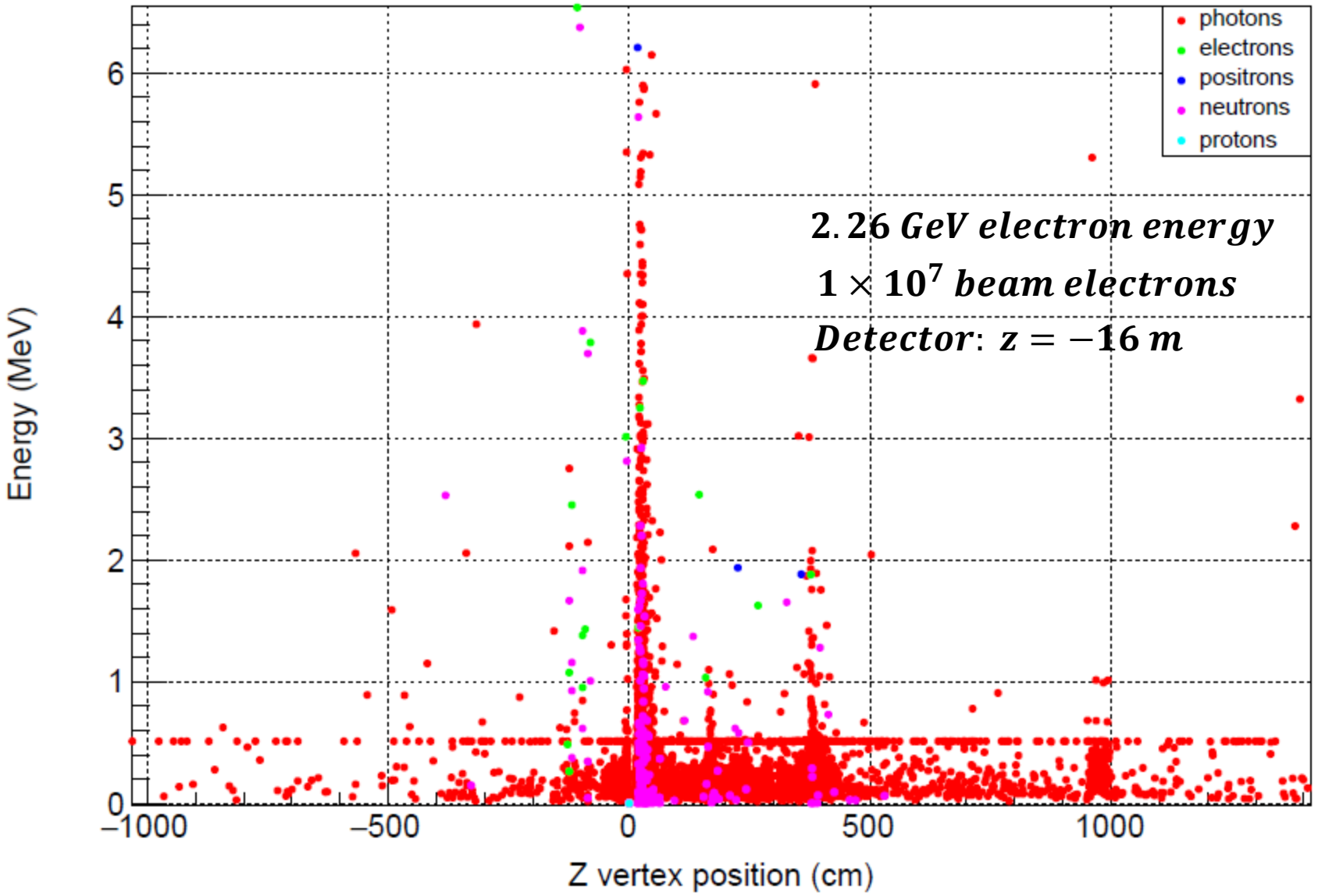
Distribution of energy sources in Hall-A



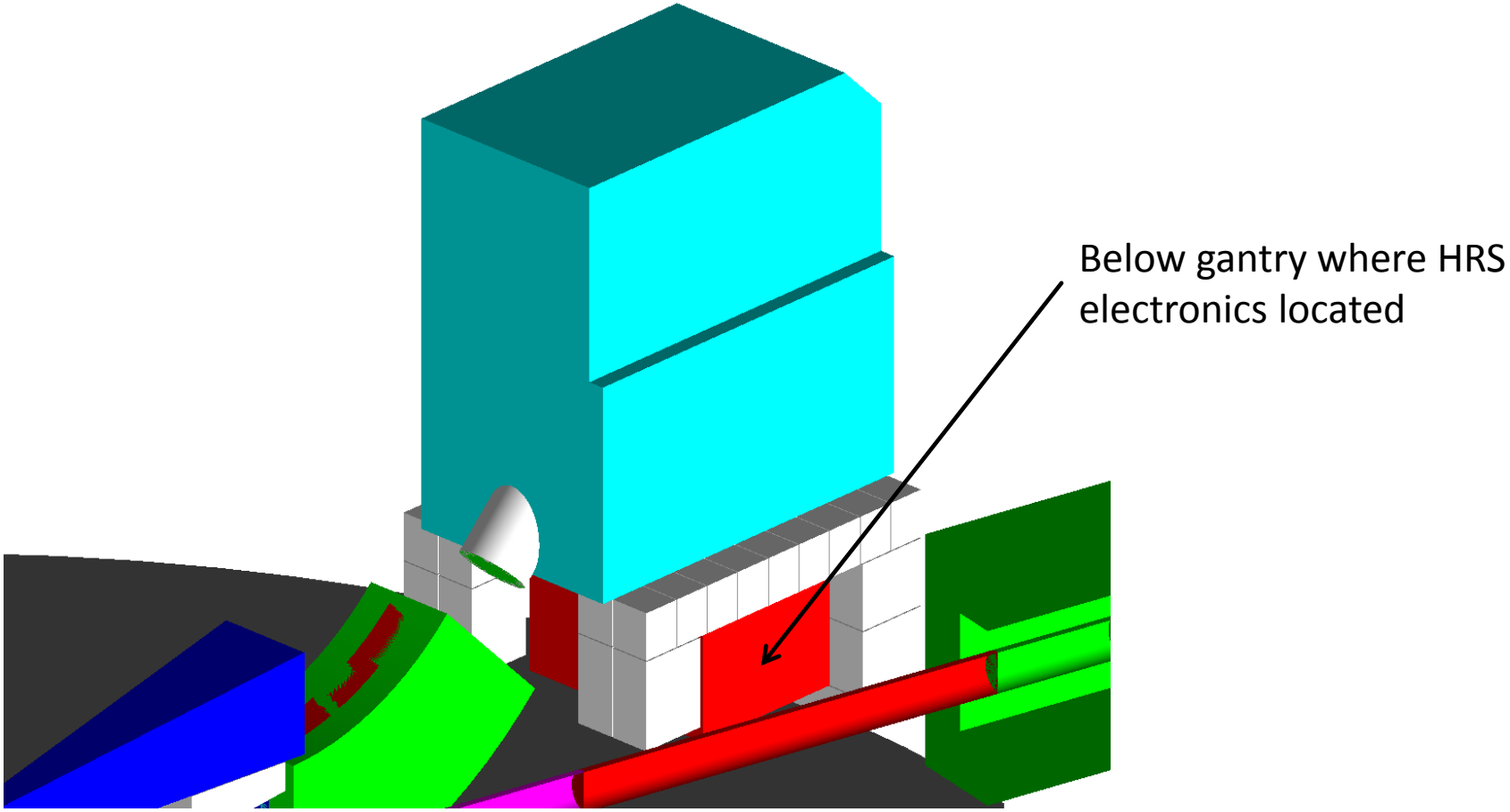
Distribution of particle energy in Hall-A



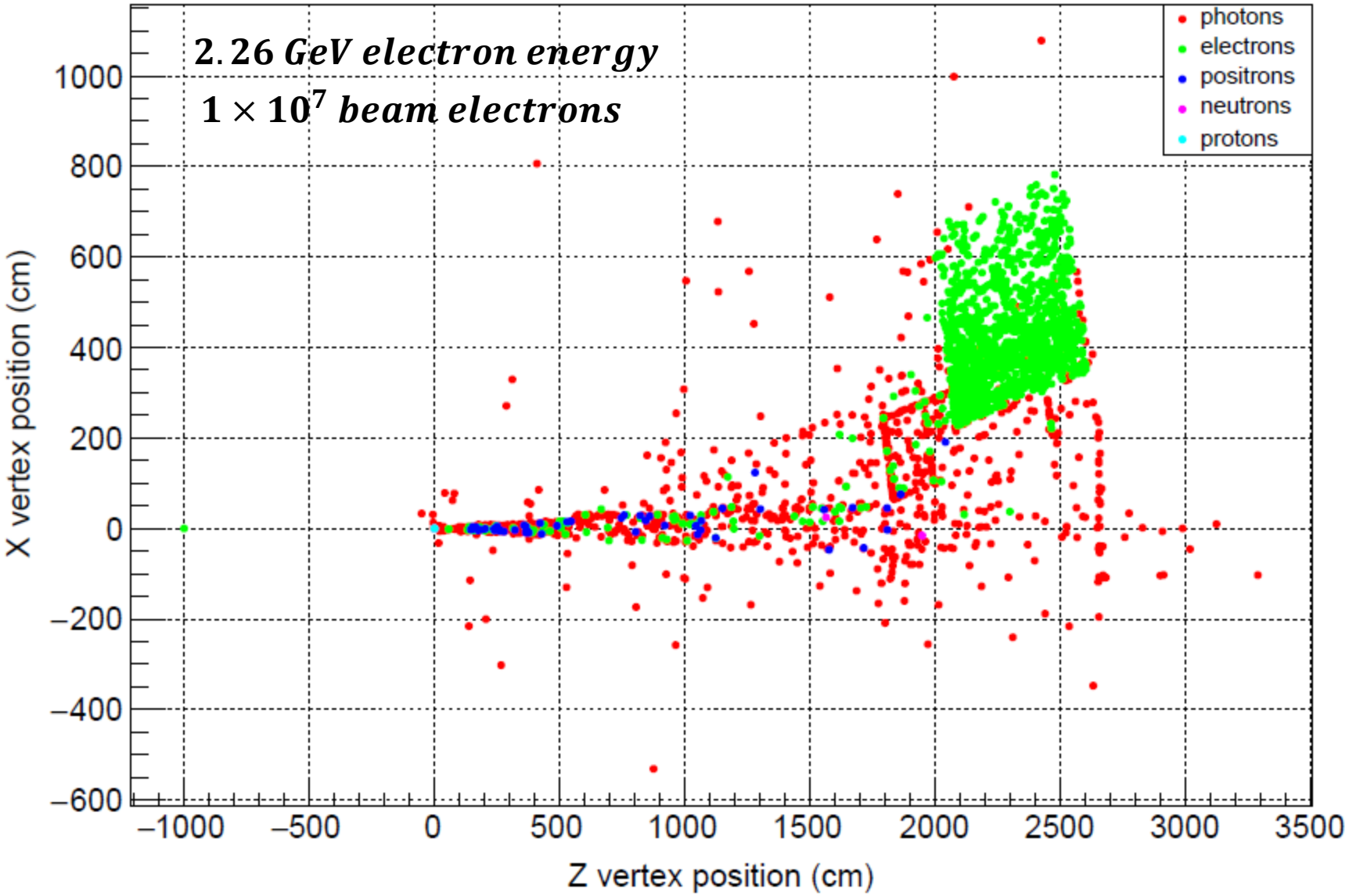
Distribution of particle energy in Hall-A



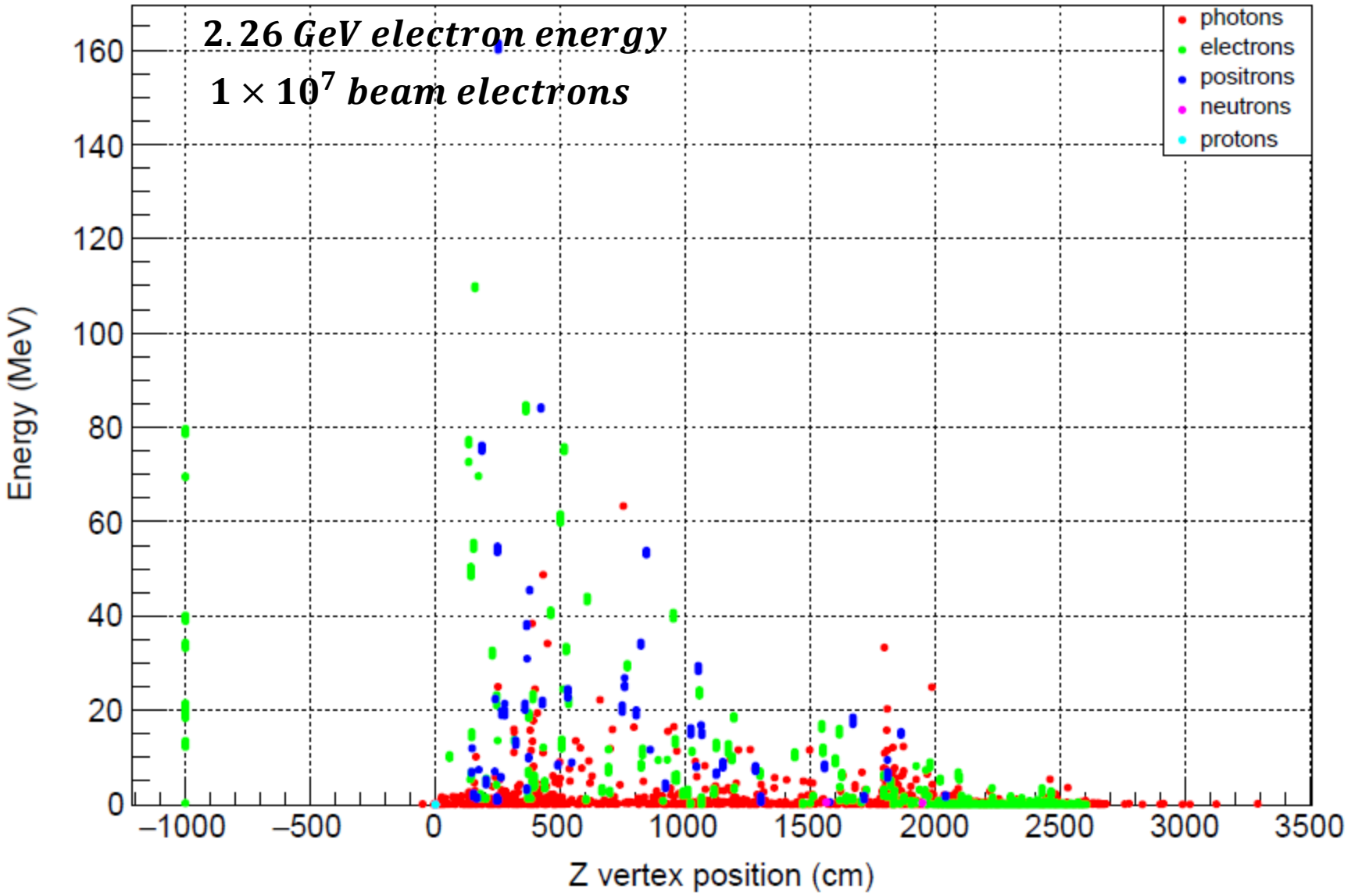
Position of Detector 2



Distribution of energy sources in Hall-A

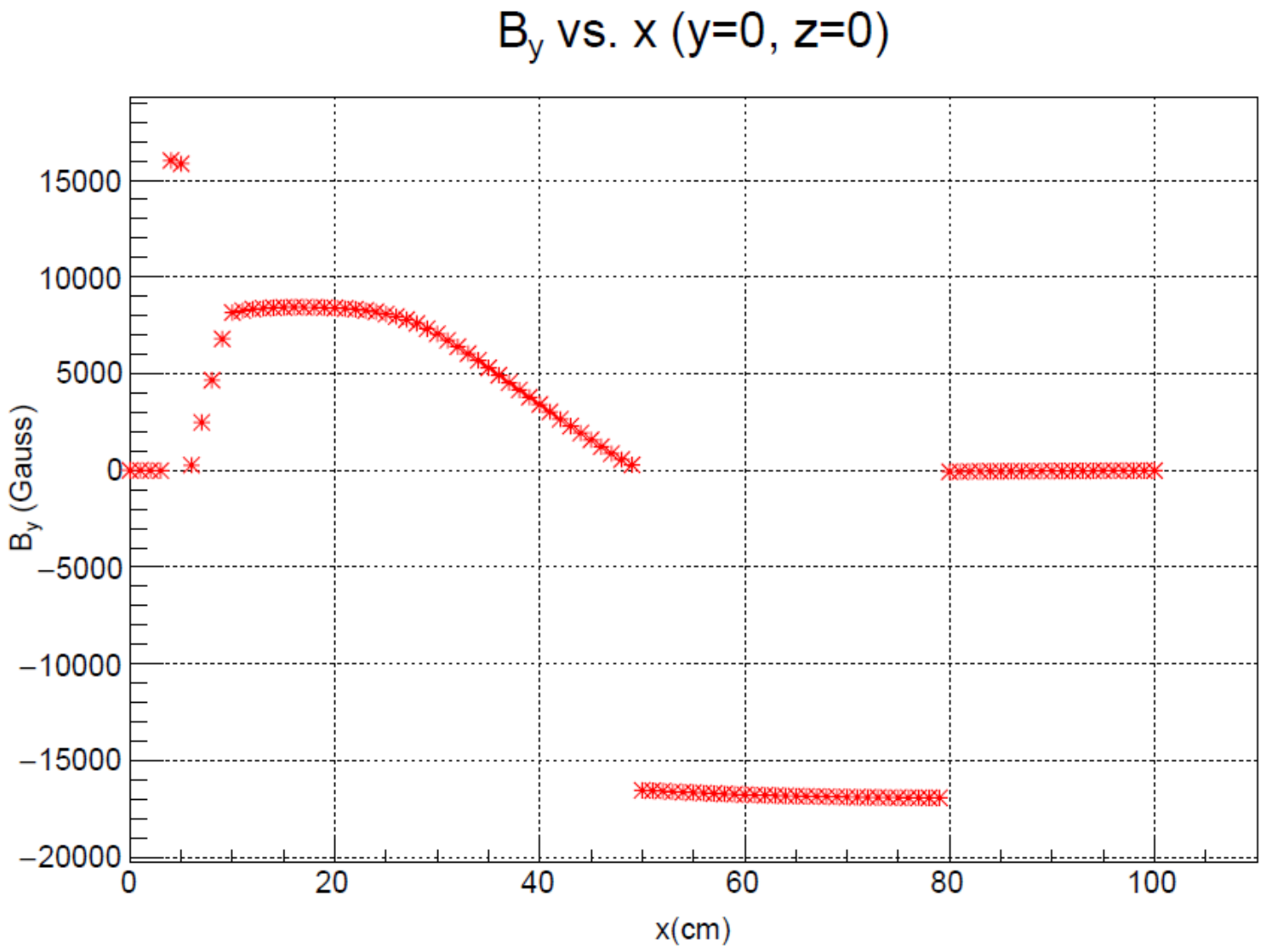


Distribution of particle energy in Hall-A

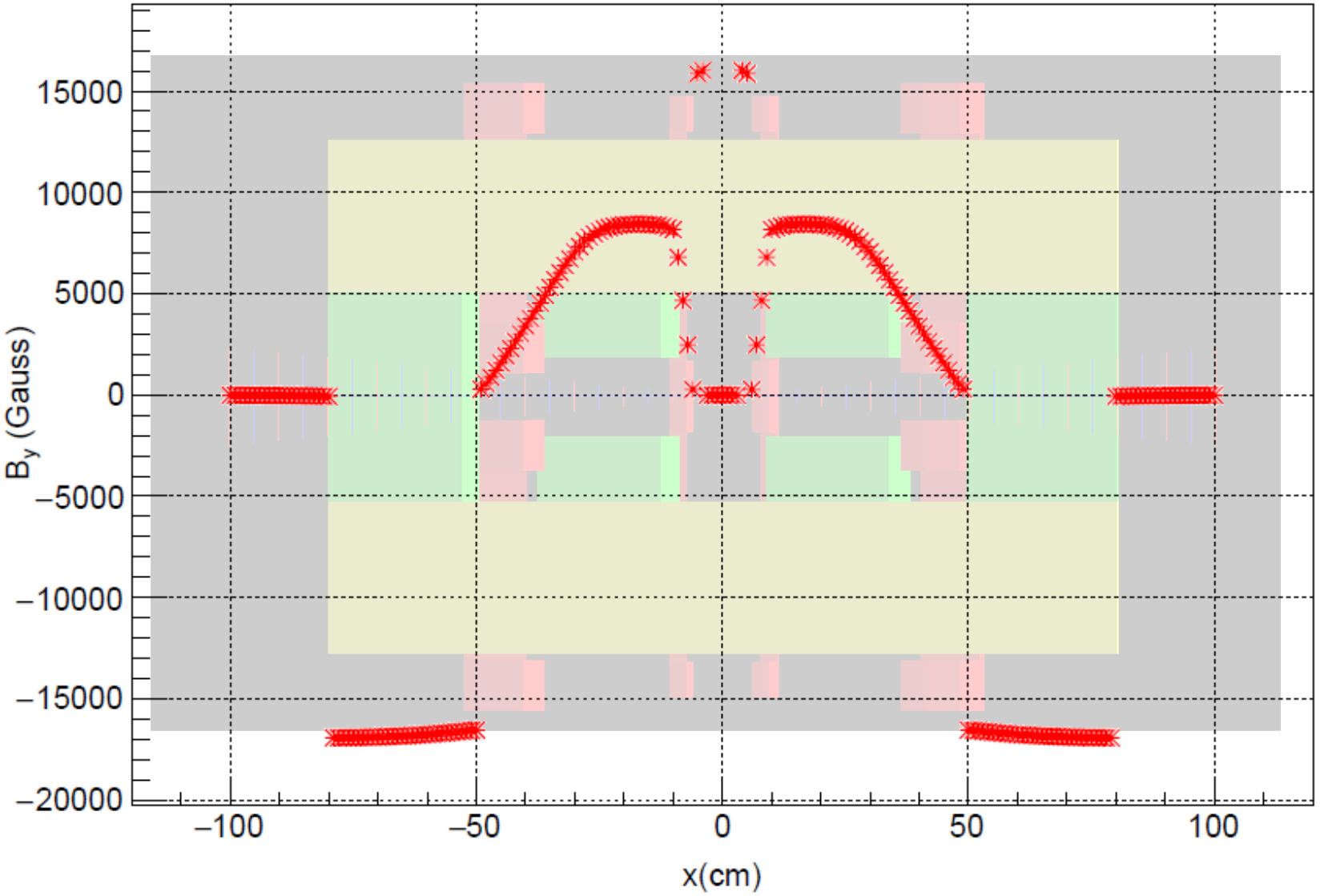


Work on Progress

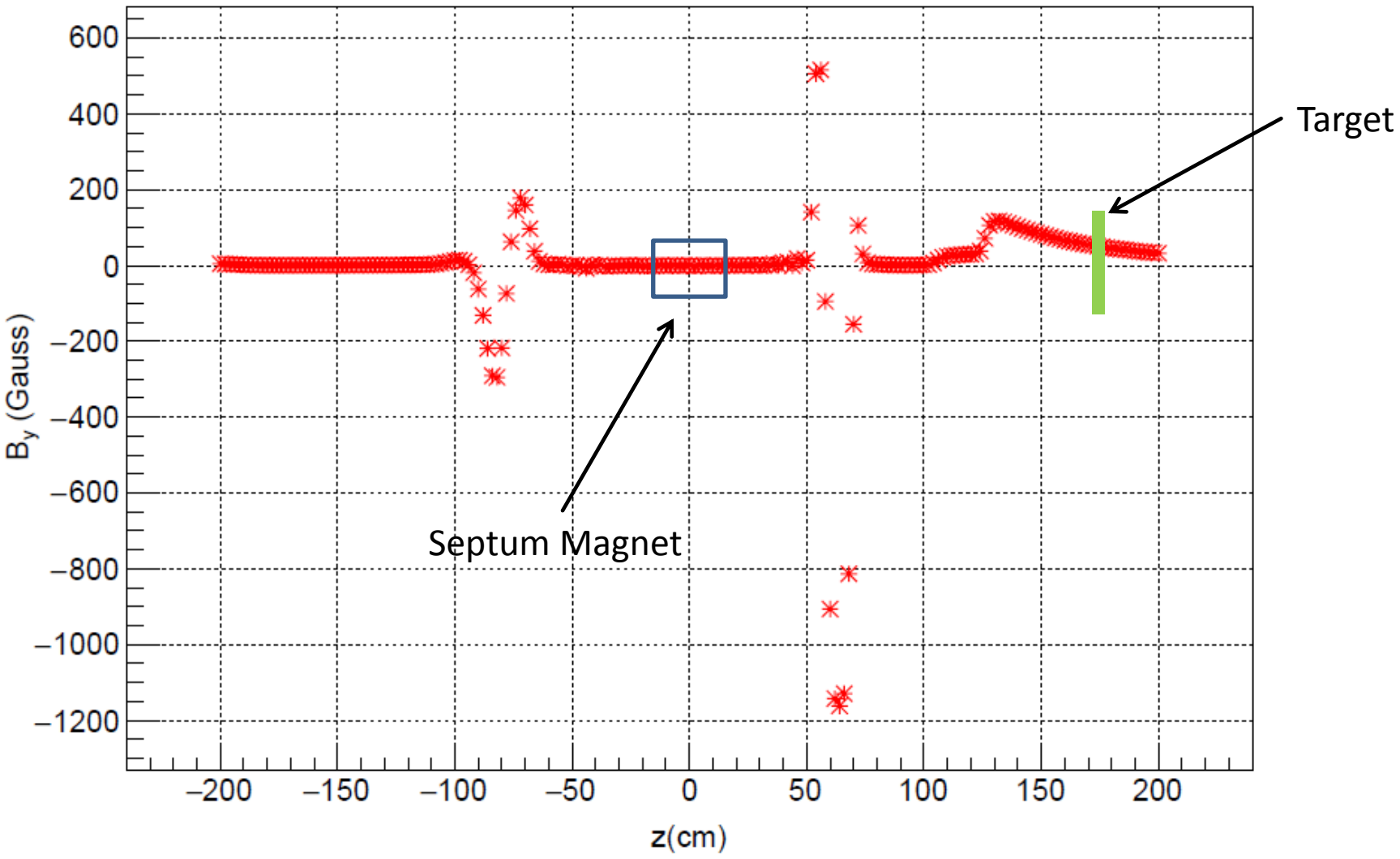
Septum Magnetic Field



B_y vs. x (y=0, z=0)

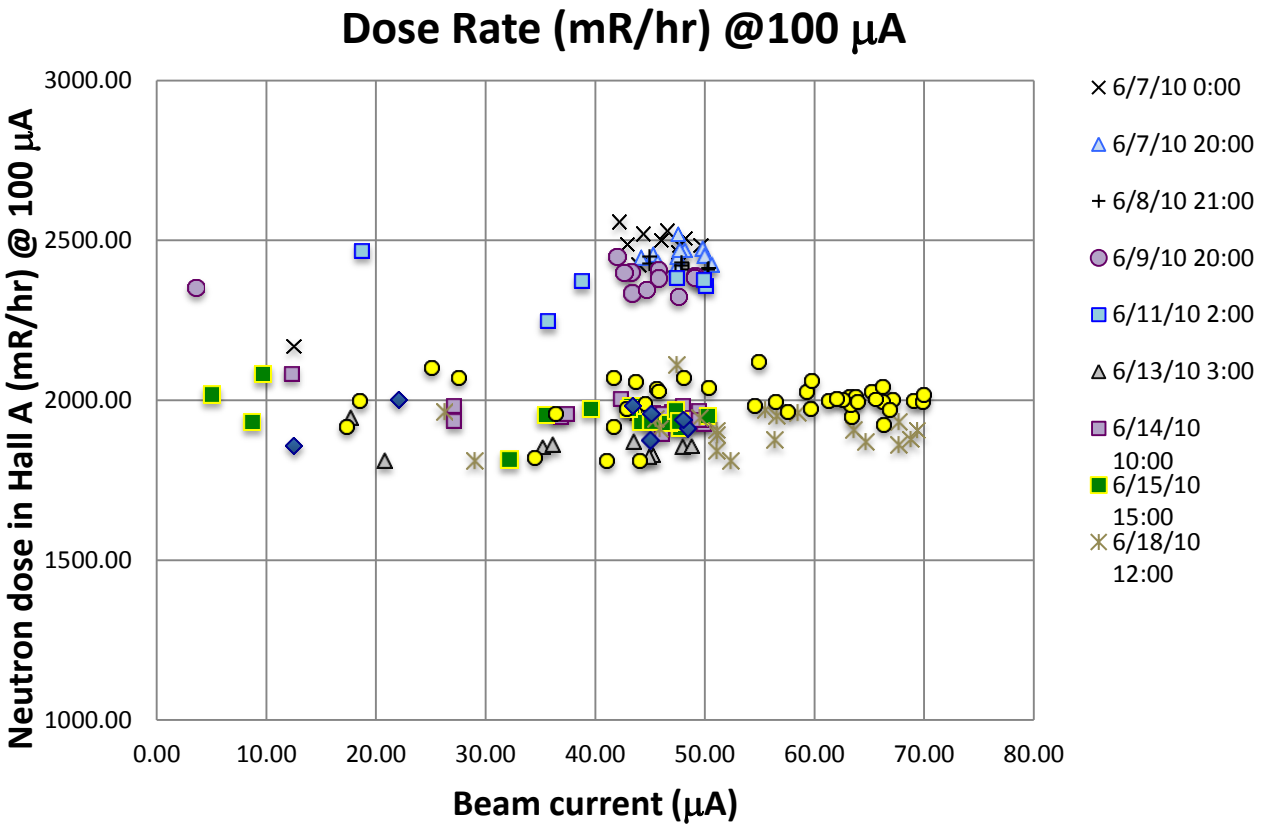

15000
10000
5000
0
−5000
−10000
−15000
−20000
B_y (Gauss)
−100
−50
0
50
100
x(cm)

Septum Magnetic Field



PREX – June 2010: E_{e^-} = 1.06 GeV

J.Boyce, 2011

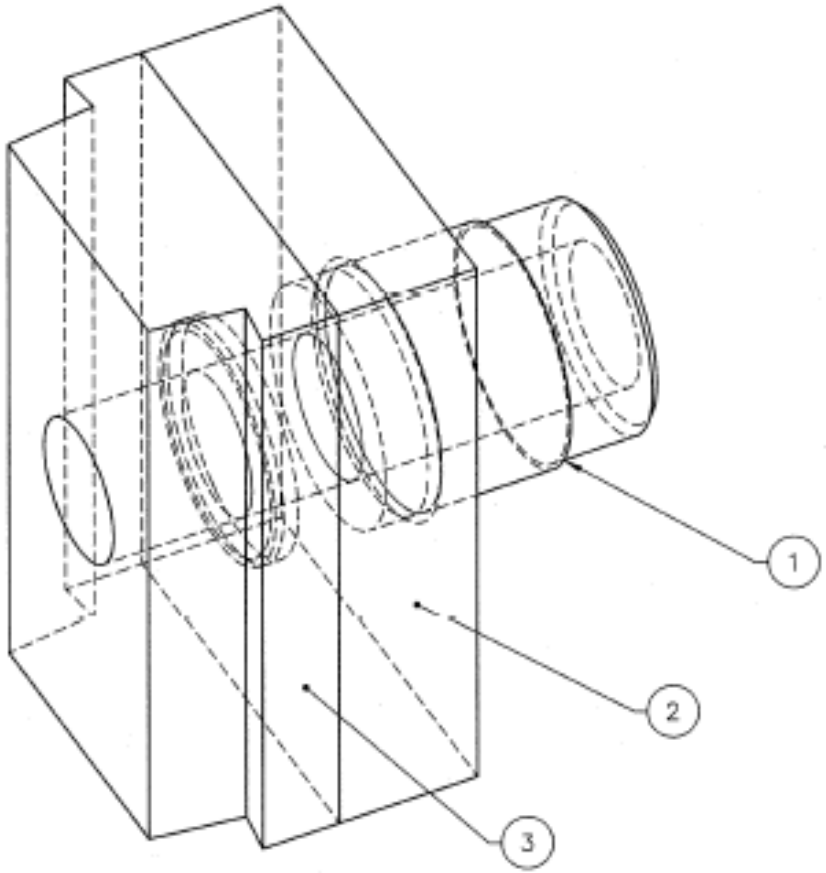


Target thickness = 637 mg/cm² (Pb)

Average Dose Rate = 2080 mR/hr at 100 μA

"Predicted" Dose Rate = 12000 mR/hr at 100 μA

PREX Collimator



QTY REQD	ITEM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	NOTES
1	3	65520-C-34801-03	UP-STREAM SECTION	TUNGSTEN	
1	2	65520-C-34801-02	MID SECTION	TUNGSTEN	
1	1	65520-C-34801-01	NOSE SECTION	TUNGSTEN	1

PARTS LIST

DIM & TOL PER ASME Y14.5 UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS ± N/A DECIMAL X ±.1 .XX ±.01 .XXX ±.002 ANGLES ± .50°

THIRD ANGLE PROJECTION

TRACKING NO. N/A

APPROVALS	DATE
DRAWN GAVALYA	12 NOV 03
CHECKED J. MILLER	13 NOV 03
APPROVED J. LEROSE	02 DEC 03
APPROVED J. LEROSE	02 DEC 03

Thomas Jefferson National Accelerator Facility
Newport News, Virginia
UNITED STATES DEPARTMENT OF ENERGY

HALL A - E99-115
HAPPEX II
BEAM COLLIMATOR
ASSEMBLY

SIZE	DWG. NO.	REV.
C	65520-C-34801-00	C

SCALE 1:1 SHEET 1 OF 1