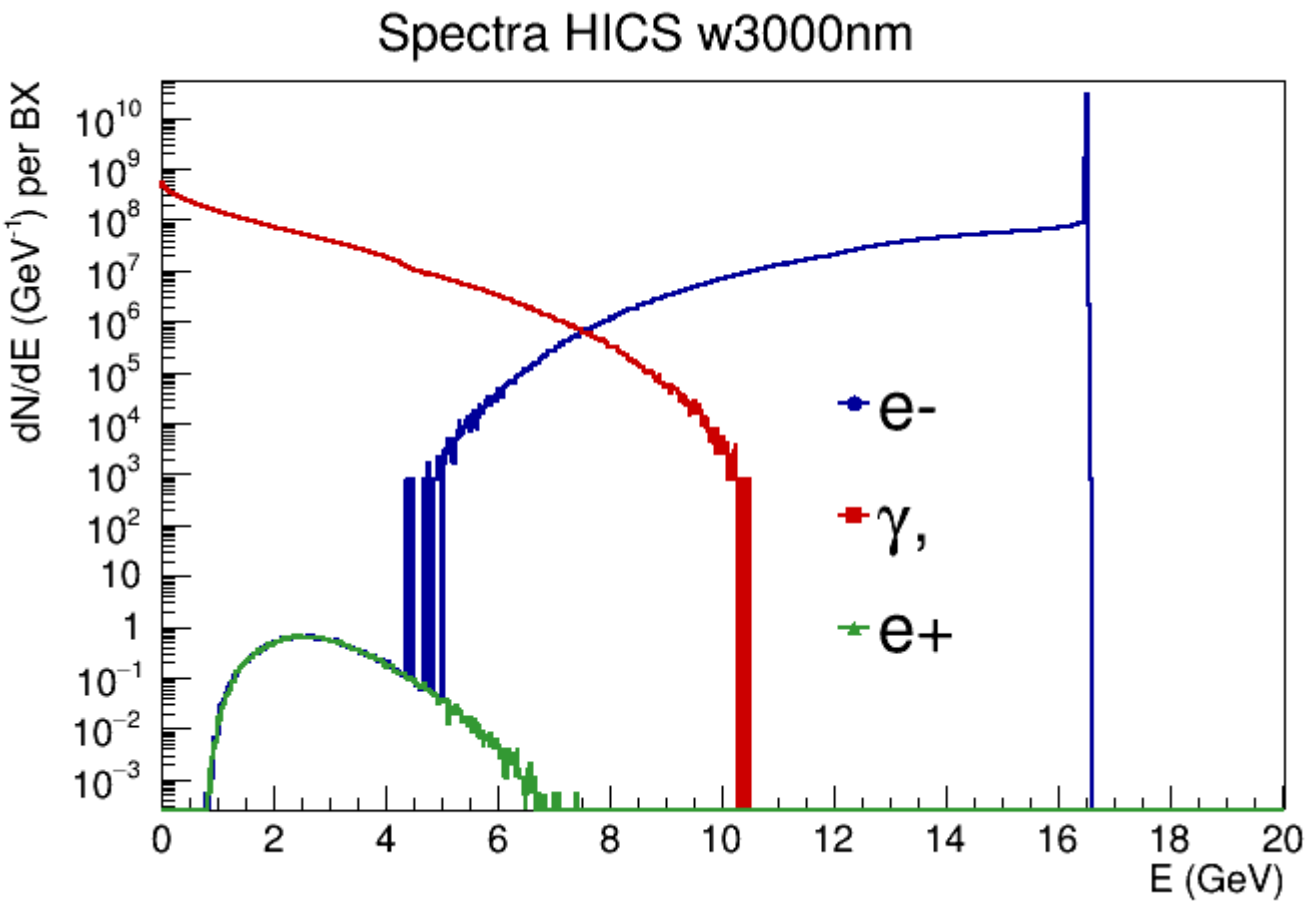
Update on LUXE GEANT4 Geometry.

Oleksandr Borysov

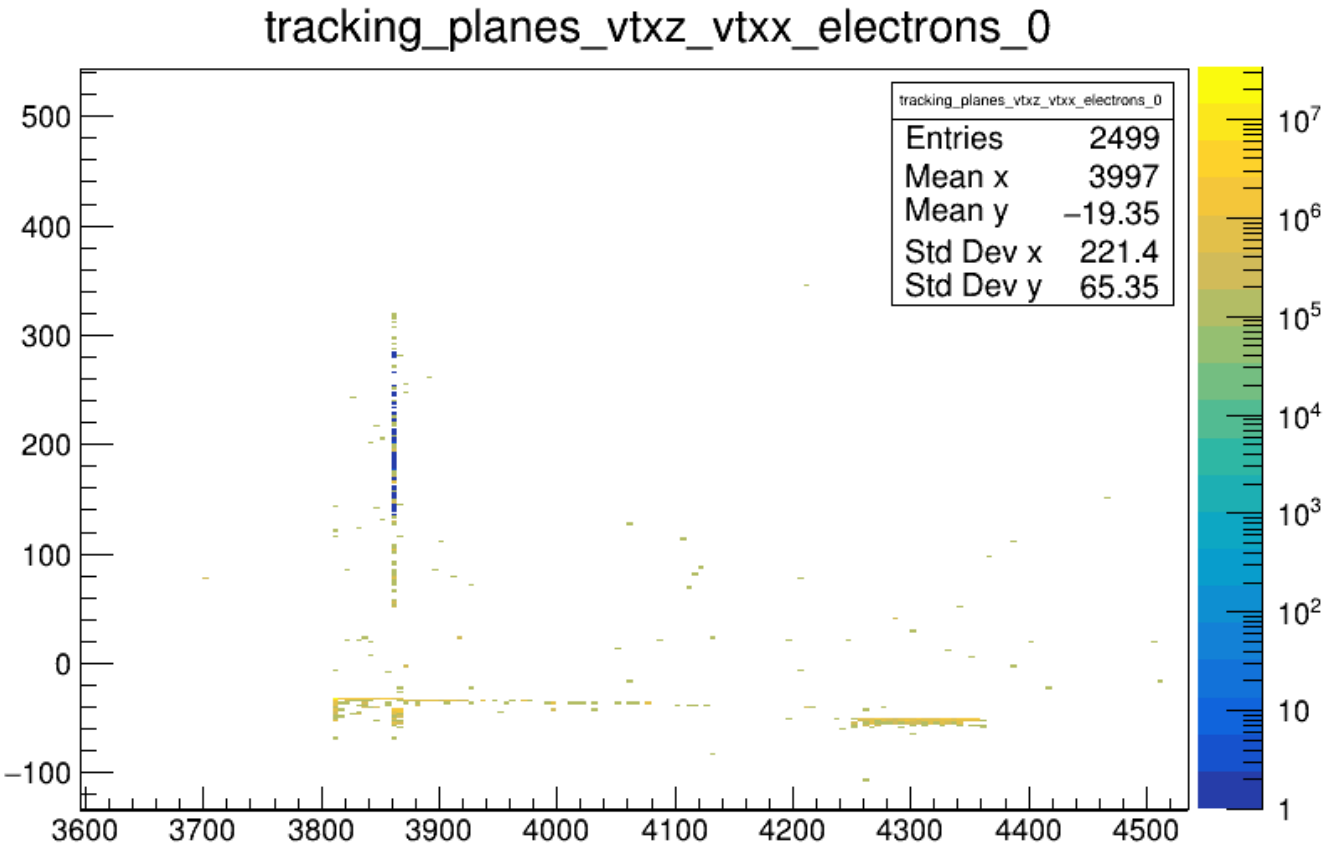
LUXE S&A Meeting
September 29, 2020

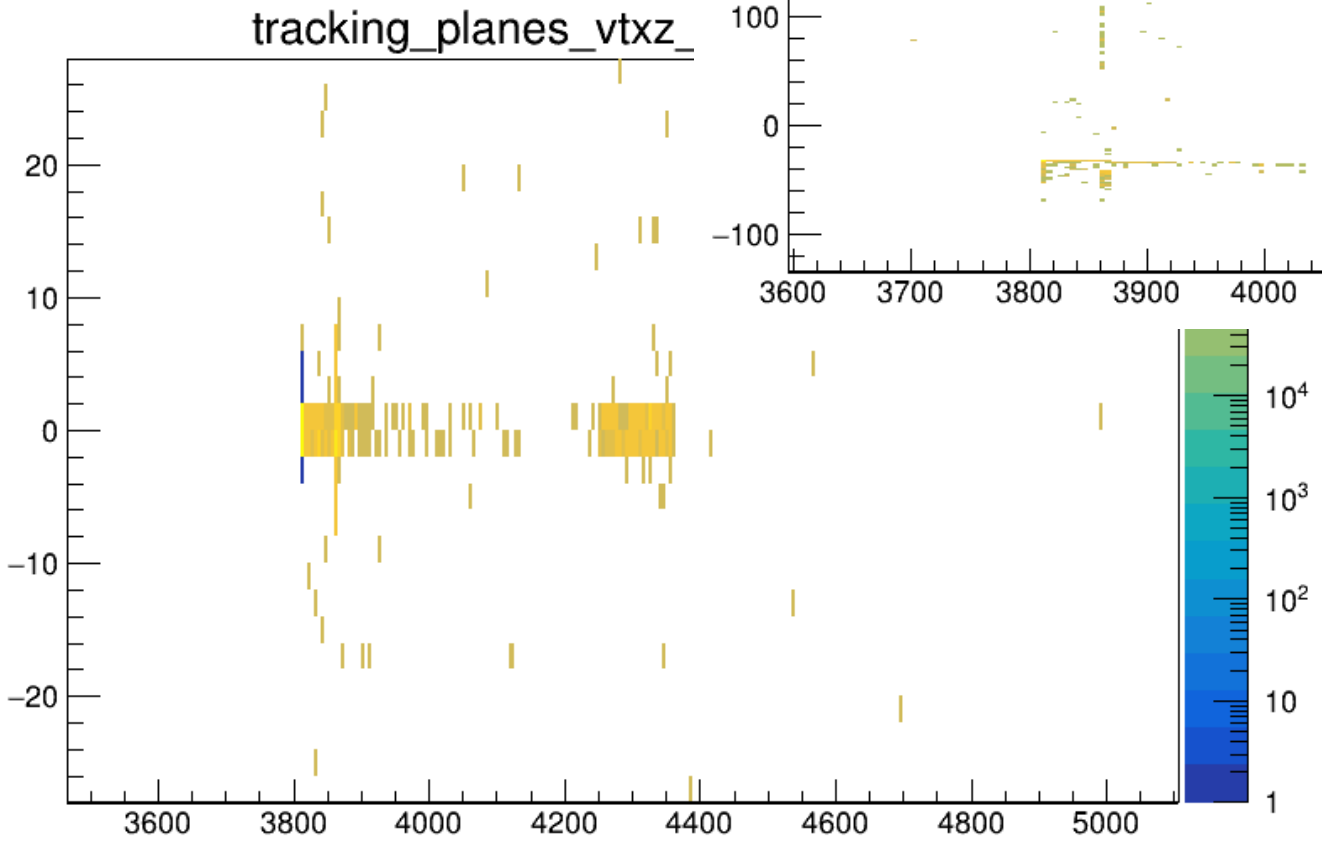
HICS MC

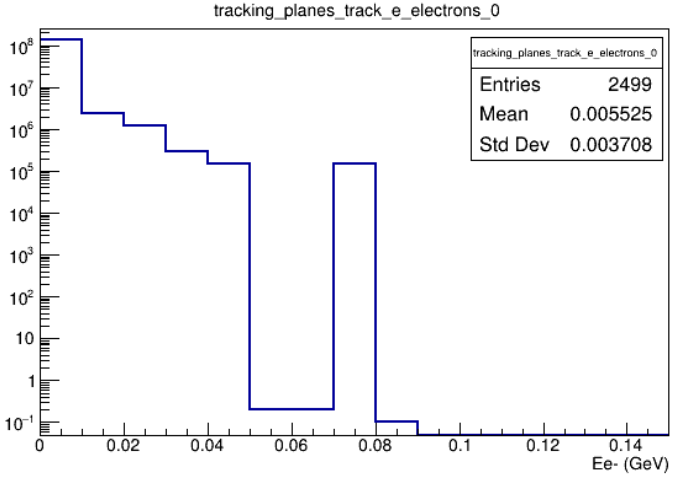
HICS, 9508 BX



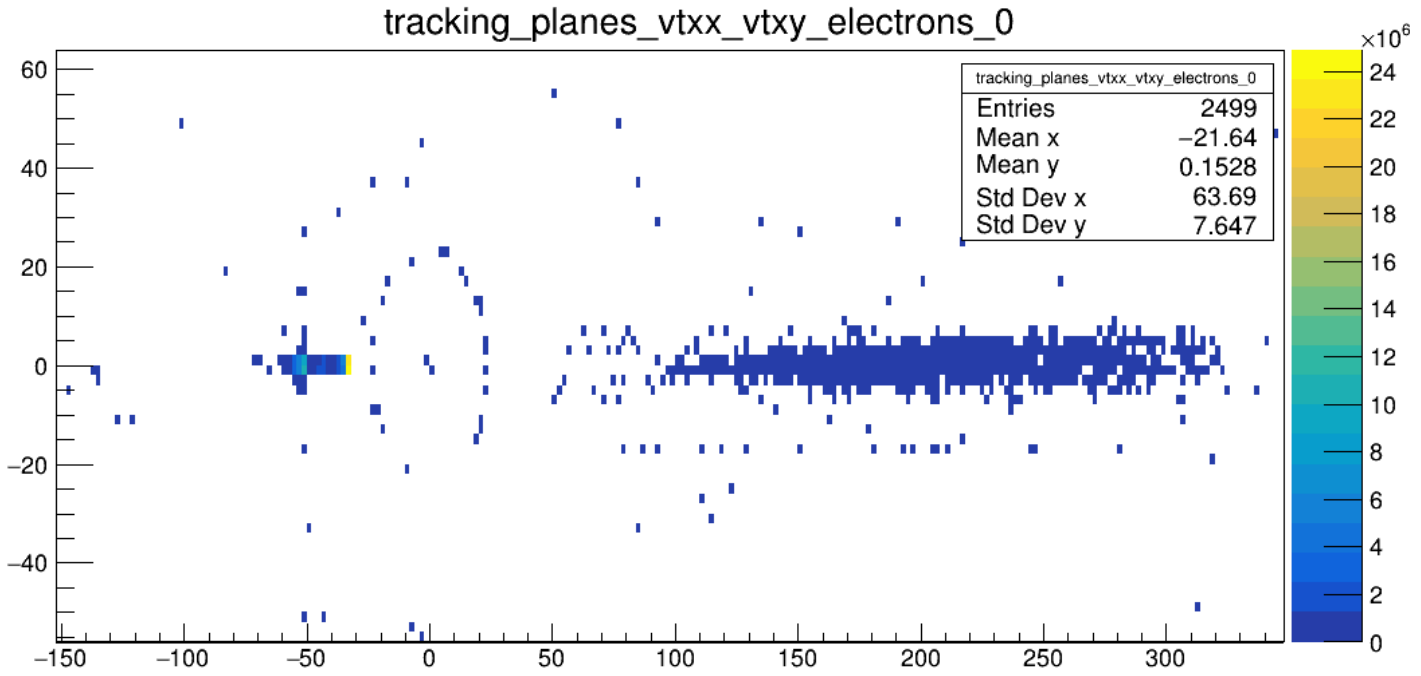
Vertex of tracks hitting inner stave of the first layer

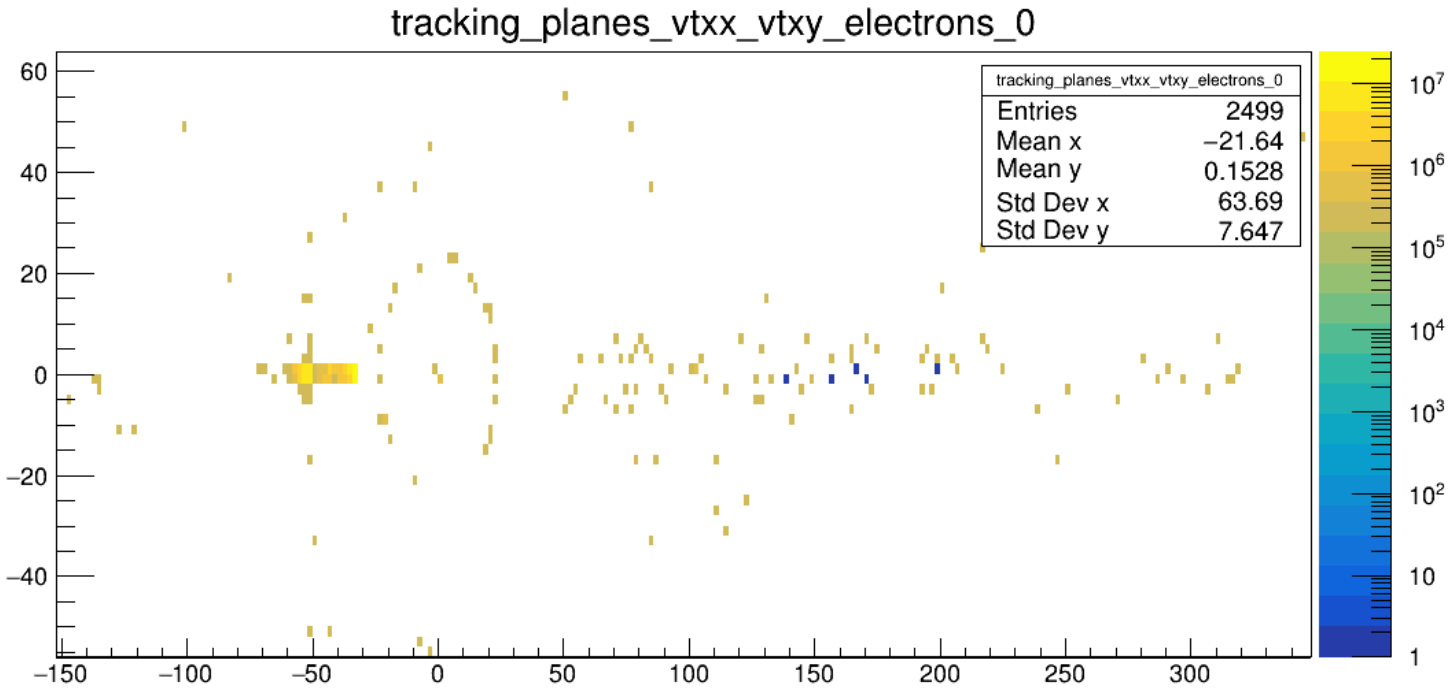




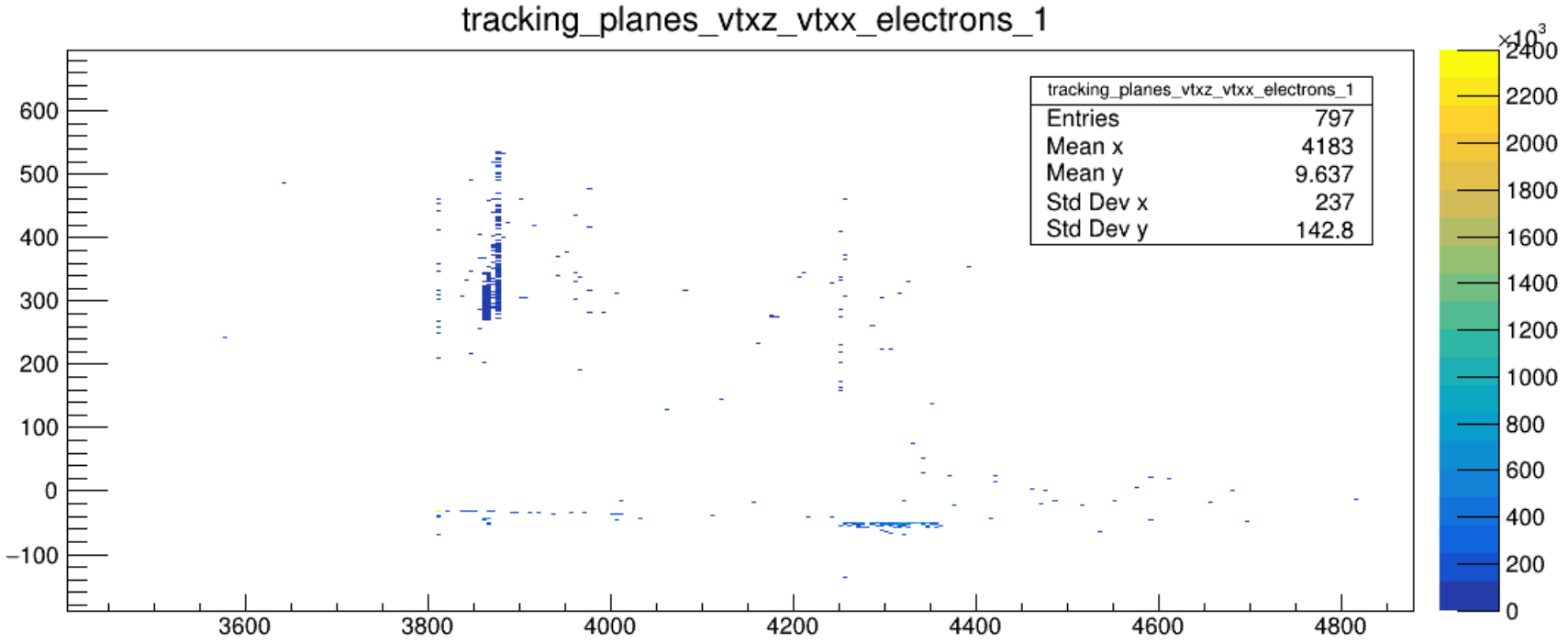


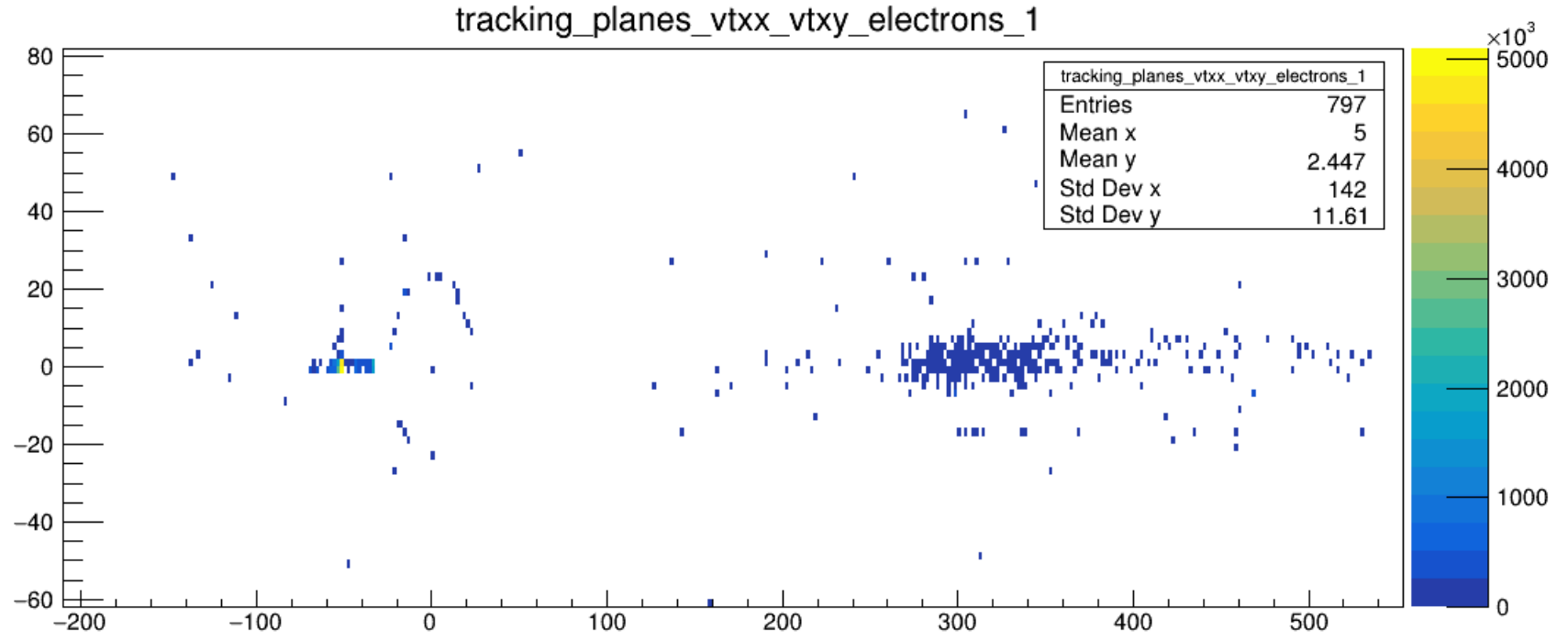
Vertex of tracks hitting inner stave of the first layer



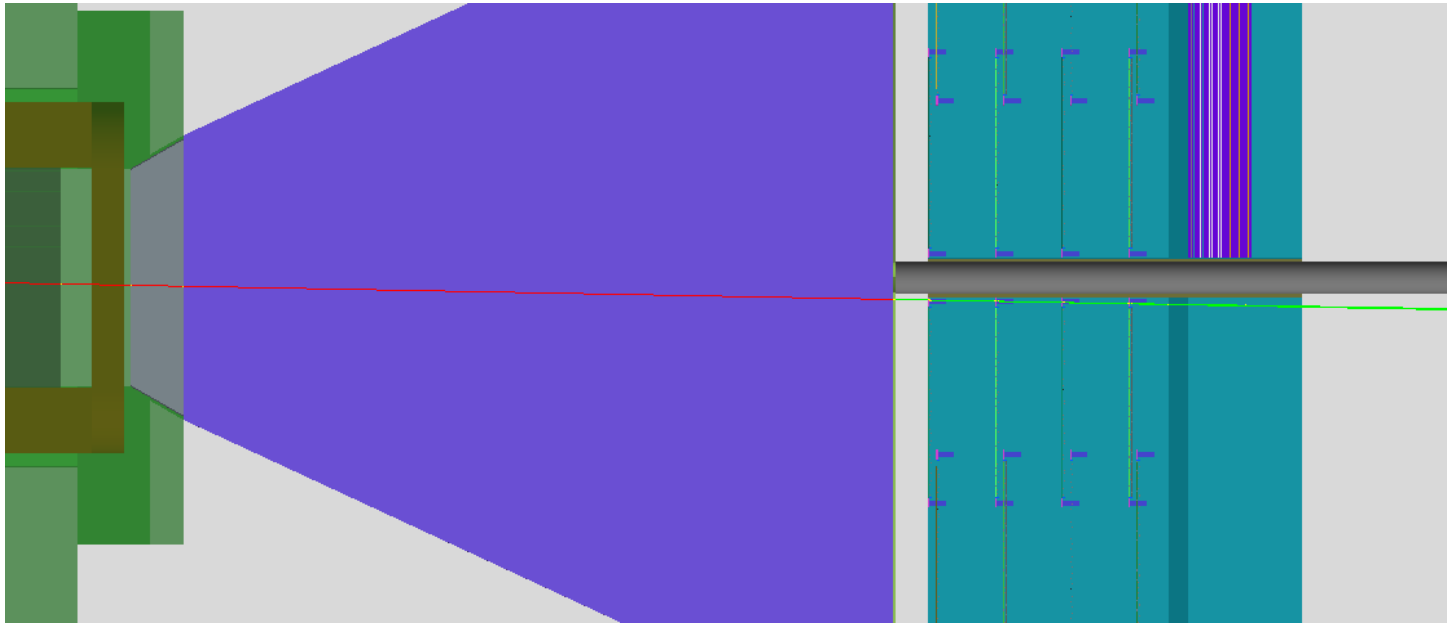


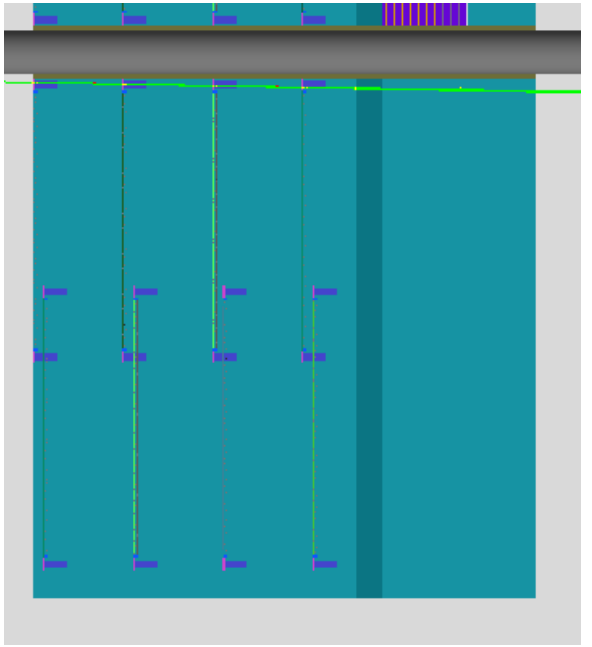
Vertex of tracks hitting outer stave of the first layer





Electron X distribution at a possible location of Cherenkov detector

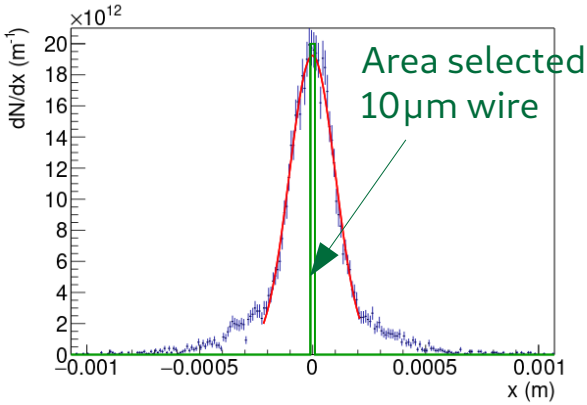




E (GeV)	X (mm)	dX (mm)
16.5	41.22	0
15	45.35	4.12
14	48.59	7.36
13	52.33	11.10
12	56.69	15.47
11	61.85	20.62
10	68.03	26.81

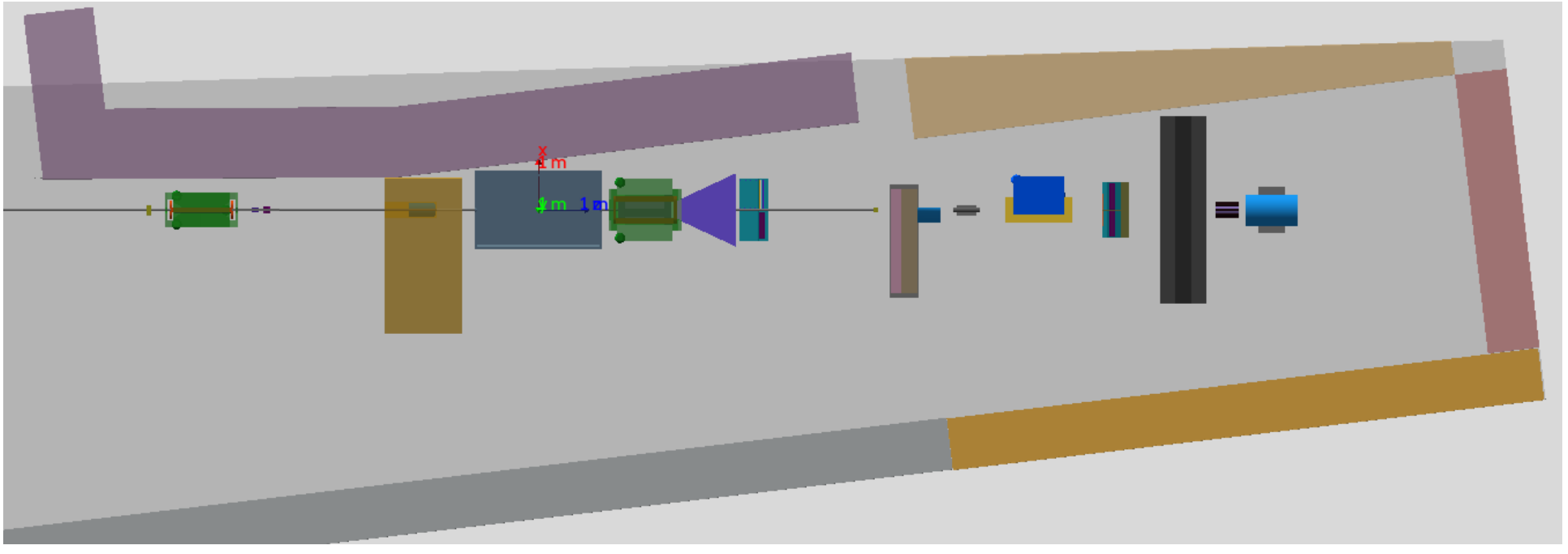
HICSScintilatorXPos = 47 *mm;
// Displacement at 1.49 m from the 1T magnet (m): 0.0374821

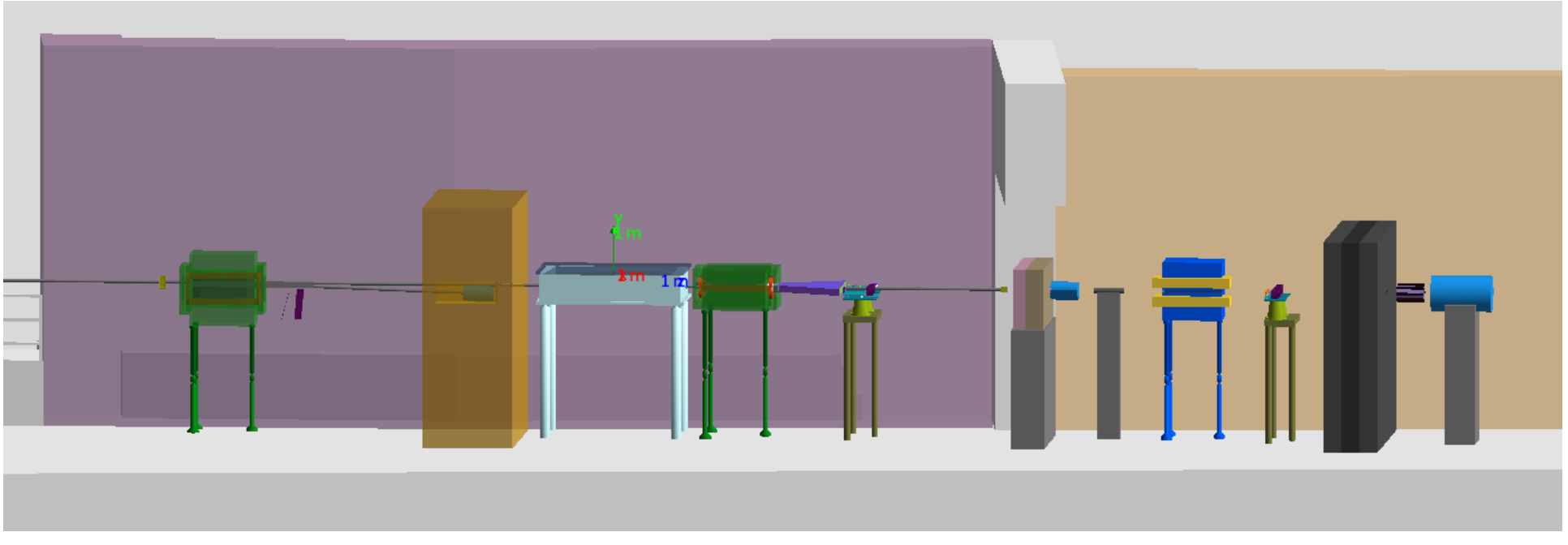
HICSCherenkovXPos = 50 *mm;
// Displacement at 1.69 m from the 1T magnet (m): 0.041222



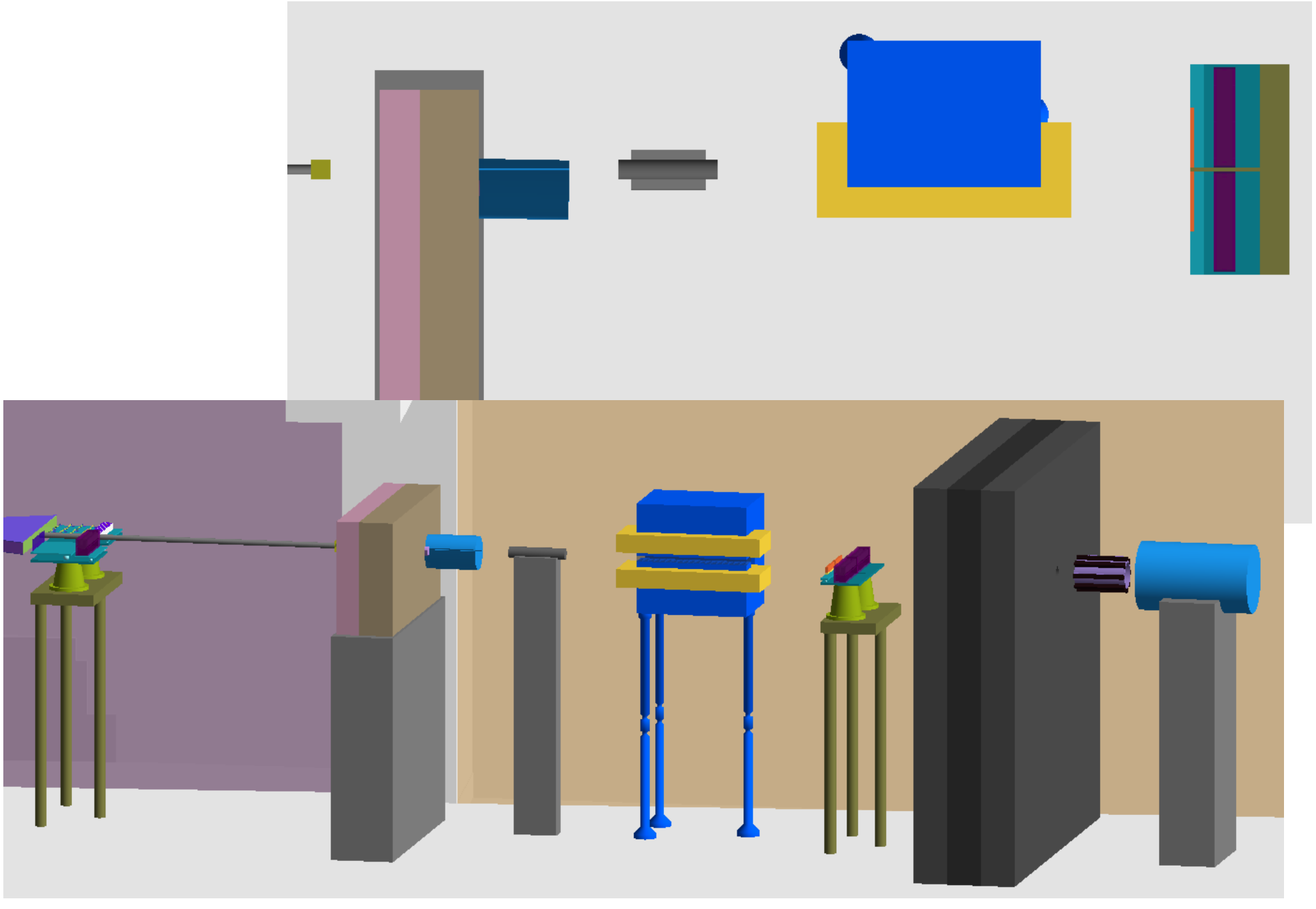
Projected 1D photon distribution 10m from IP.

LUXE GEANT4 Geometry

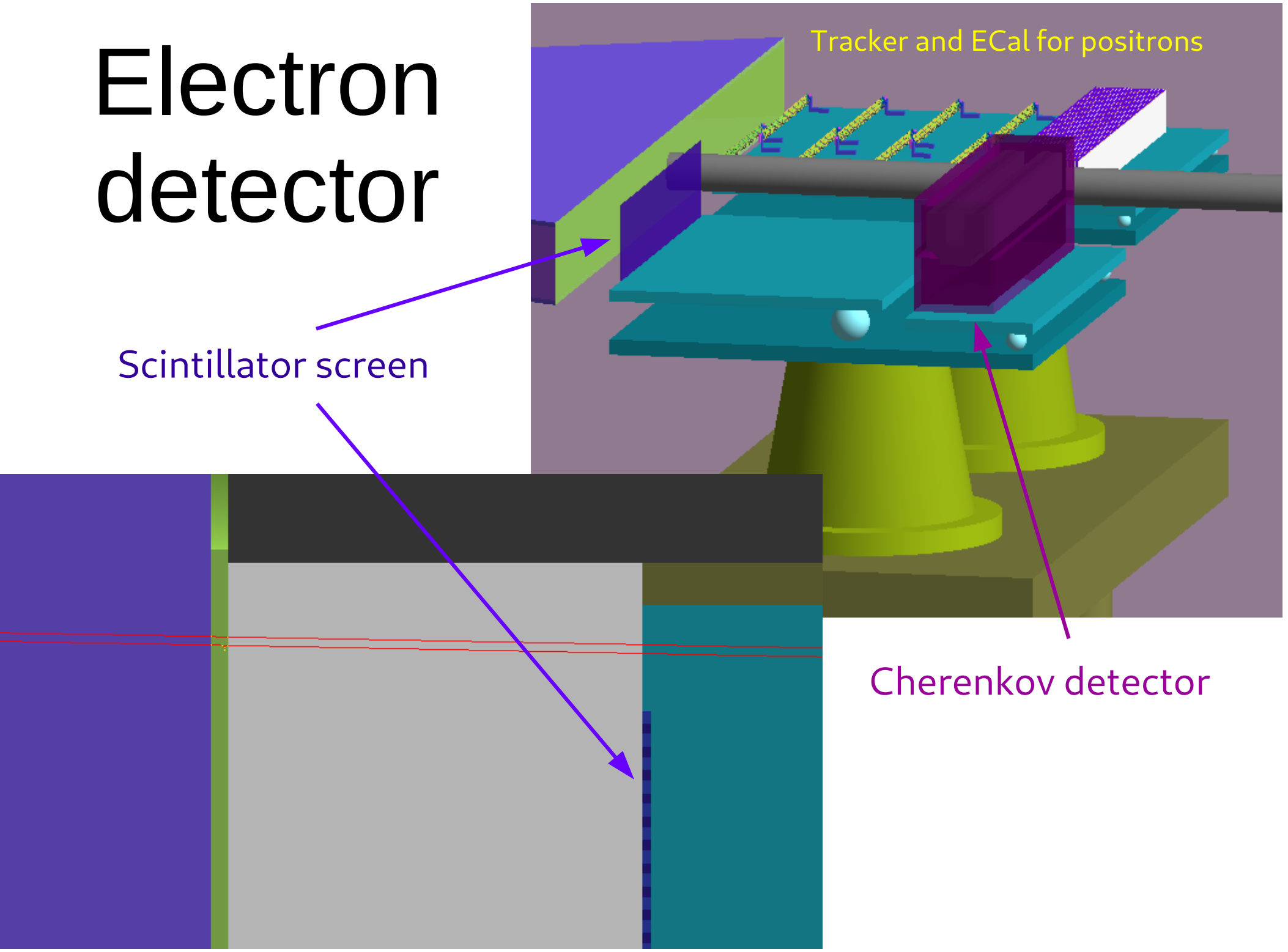




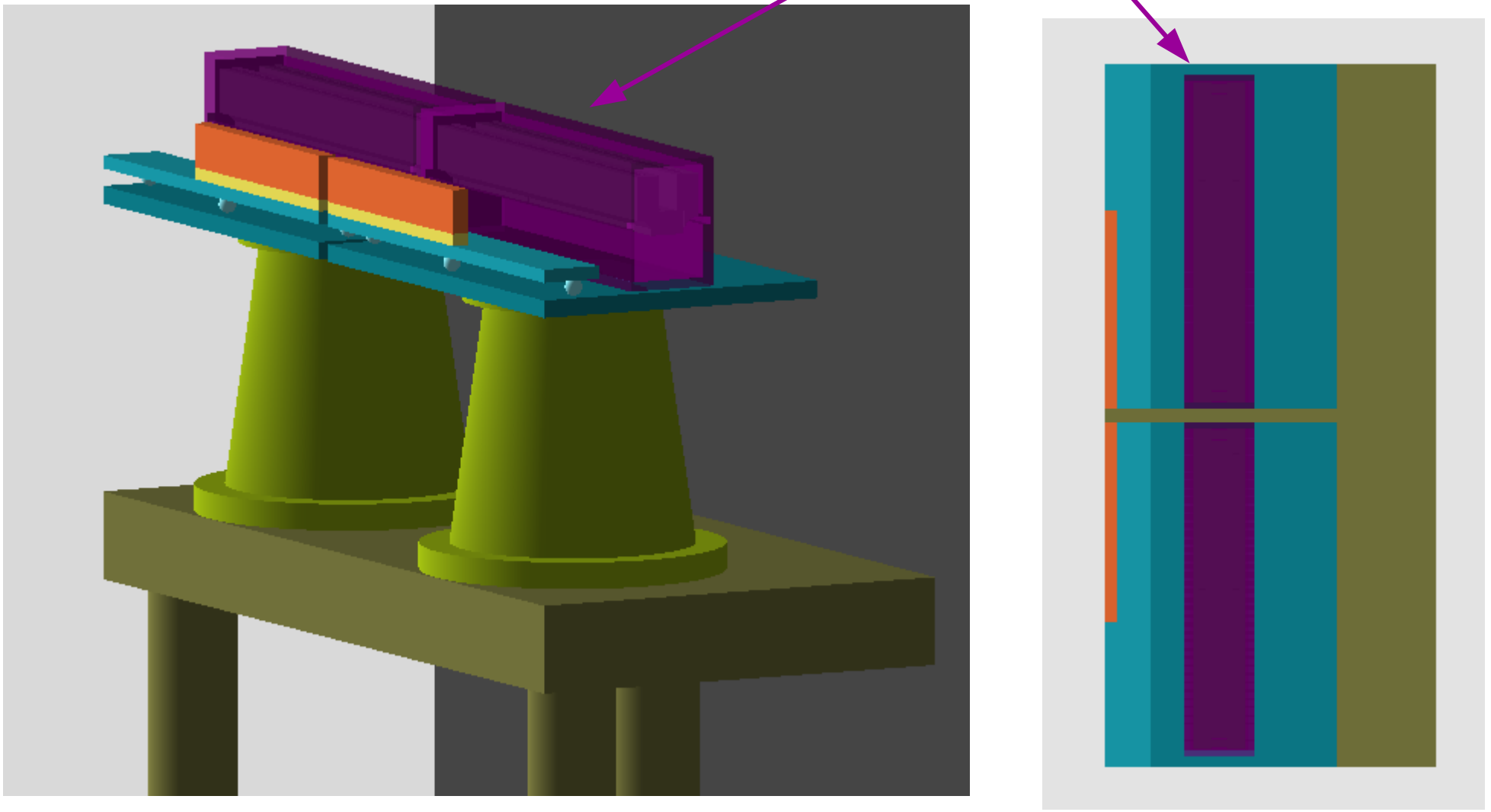
HICS setup



Electron detector



e+ e- detectors in photon spectrometer



Spectra

Aug 2020 Data Runs, bunch/pulse crossings completed

Experiment Config	$w_0 = 3\mu$m	$w_0 = 3.5\mu$m	$w = 0, 4.0\mu$m	$w_0 = 4.5\mu$m	$w_0 = 5.0\mu$m	$w_0 = 8.0\mu$m	$w_0 = 20.0\mu$m	$w_0 = 50.0\mu$m	$w_0 = 100.0\mu$m
peak SQED ξ	5.12	4.44	3.88	3.45	3.1	1.94	0.78	0.31	0.15
peak SQED χ (16.5 GeV)	0.9	0.79	0.69	0.61	0.55	0.34	0.138	0.055	0.028
JETI40 e-laser 16.5 GeV	939	951	946	949	938	1000	193	200	200
JETI40 e-laser 17.5 GeV	639	1000	1000	1000	1000	500			
JETI40 g-laser 16.5 GeV	1000	1000	999	1000	1000	1000			
JETI40 g-laser 17.5 GeV									
JETI40 misalignments									
JETI40 mCP production									

/afs/desy.de/group/flc/luxe/IPstrong_V1.1.00/JETI40/e_laser/16.5GeV/w0_3031nm
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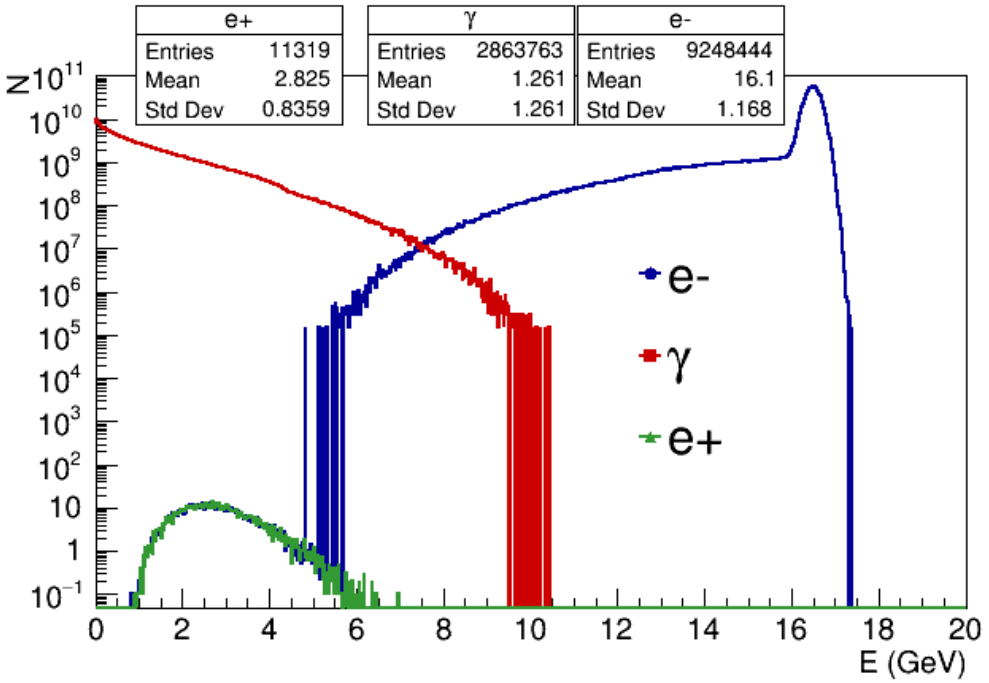
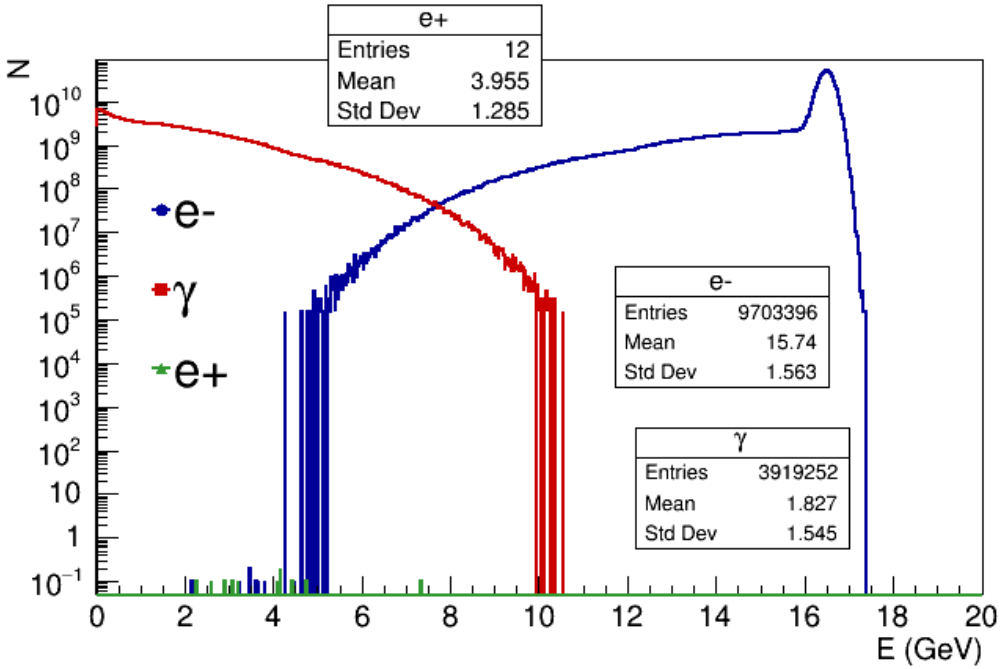
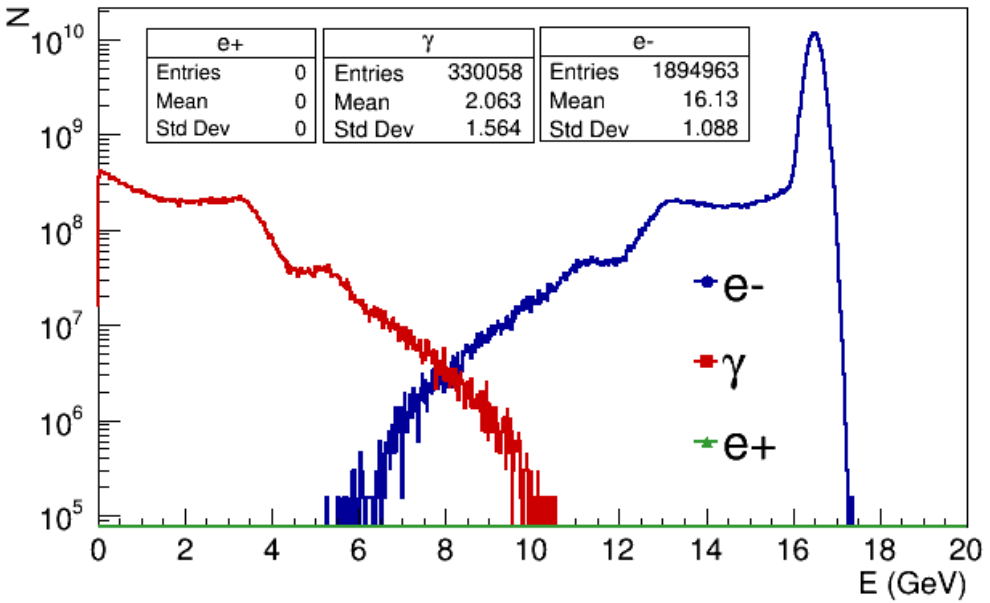
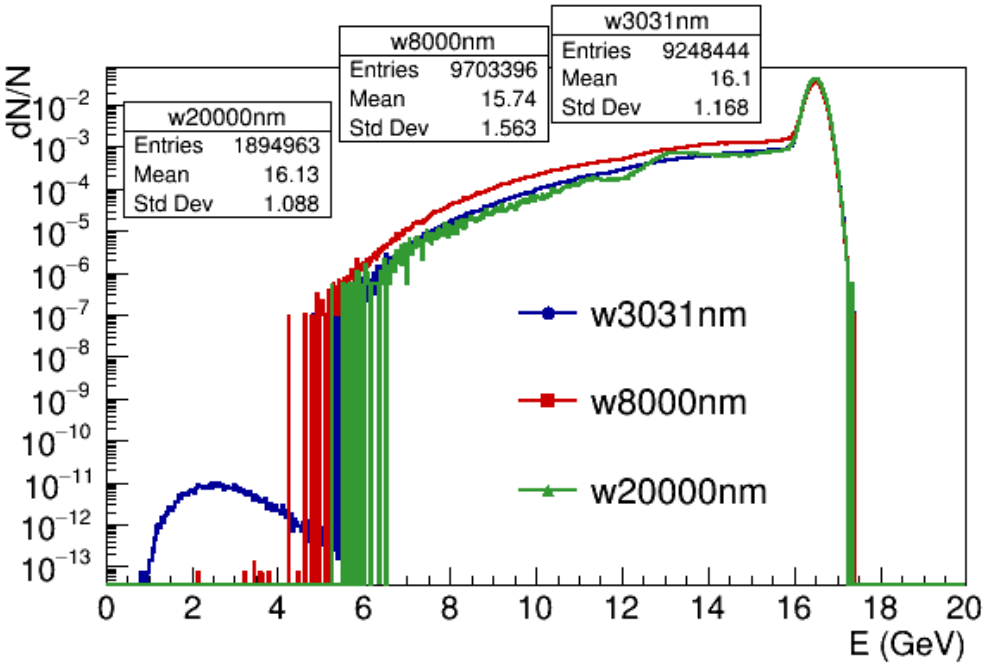
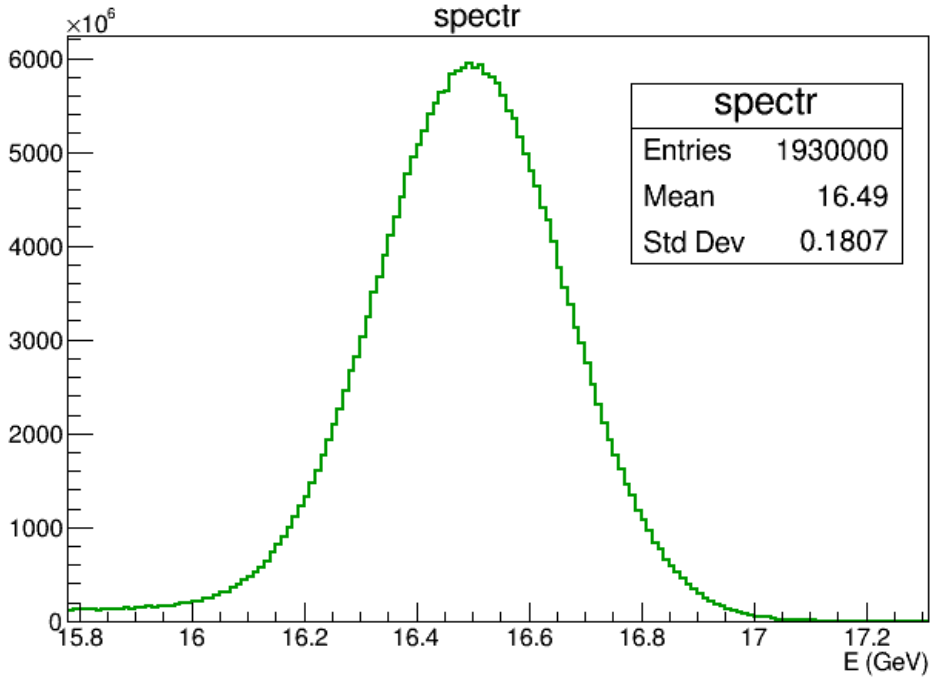


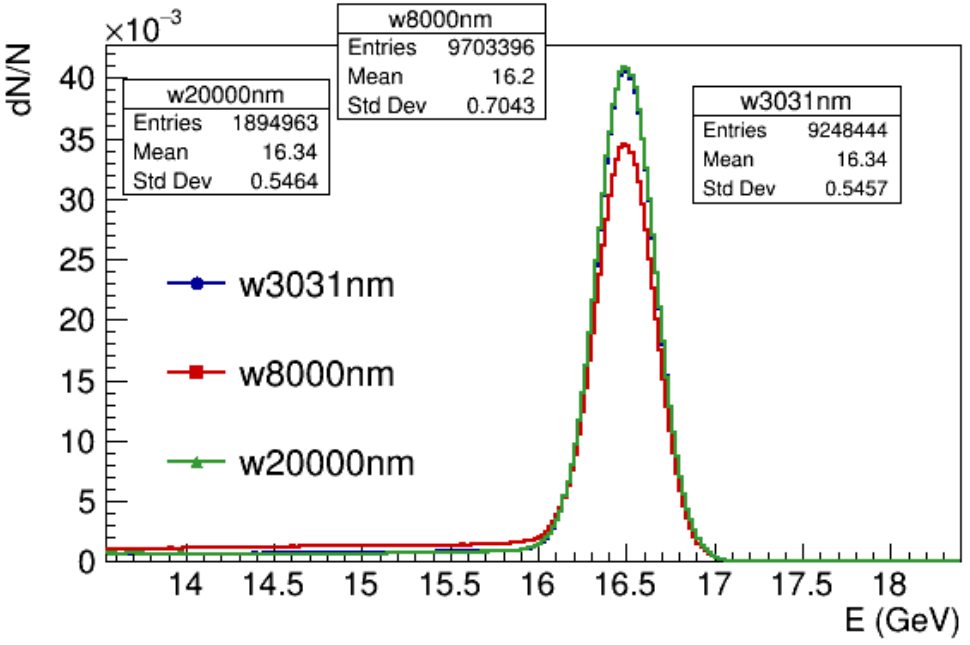


HICS spectra for different laser beam spot size

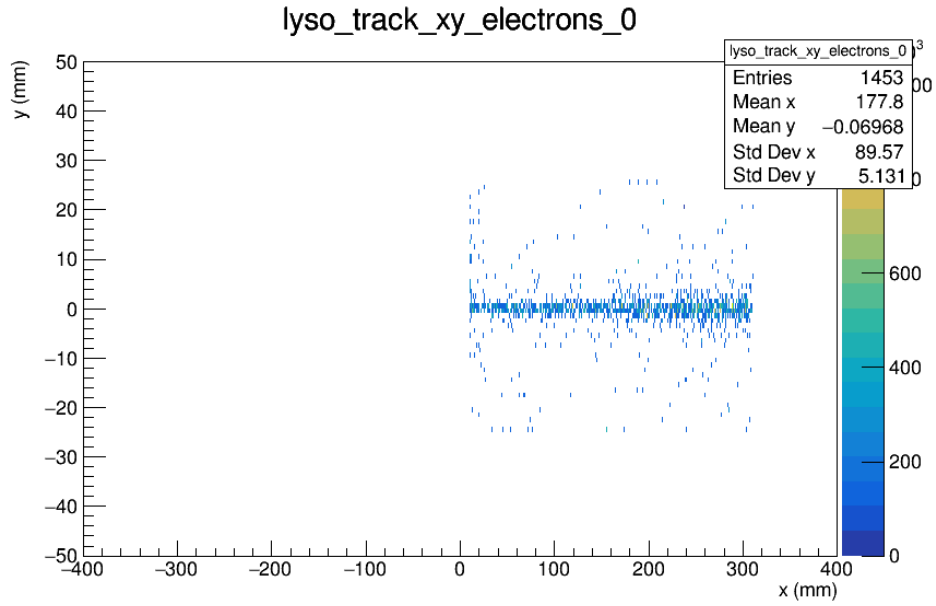


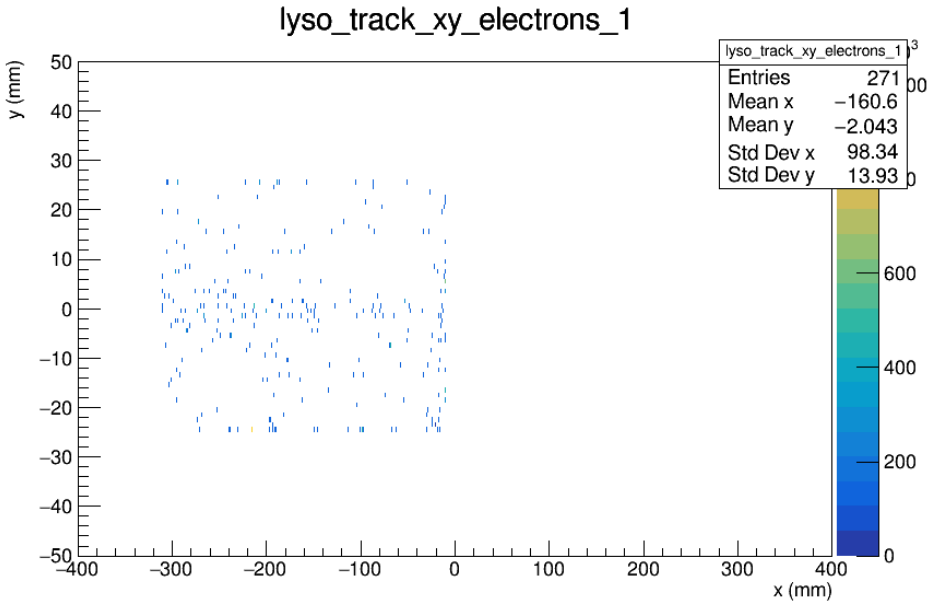


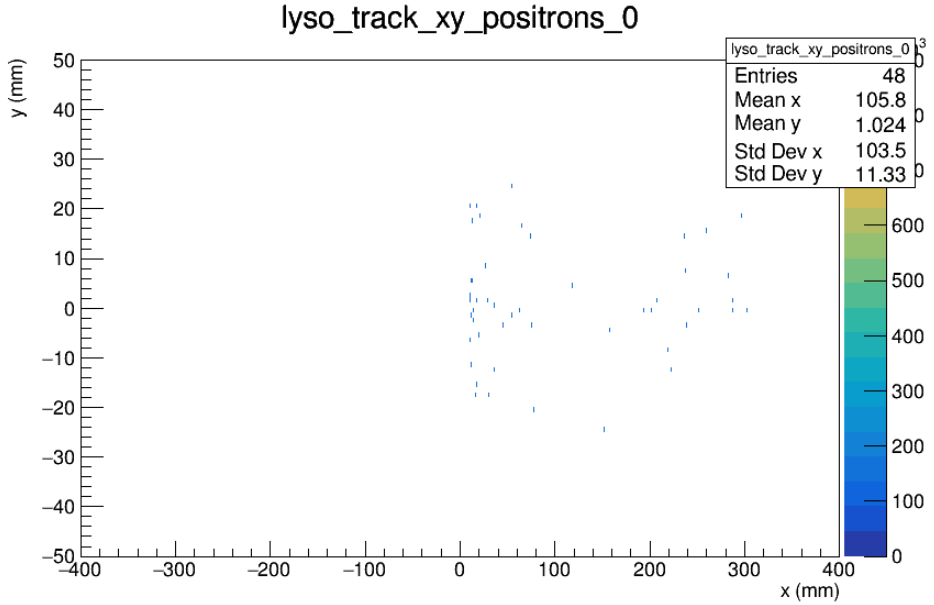


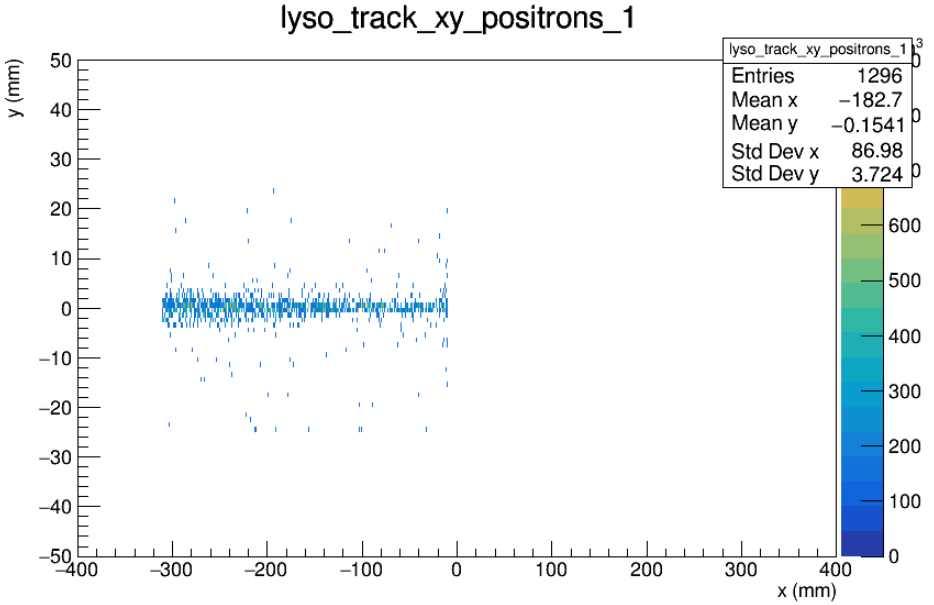


Tracks in LYSO (LANEX)

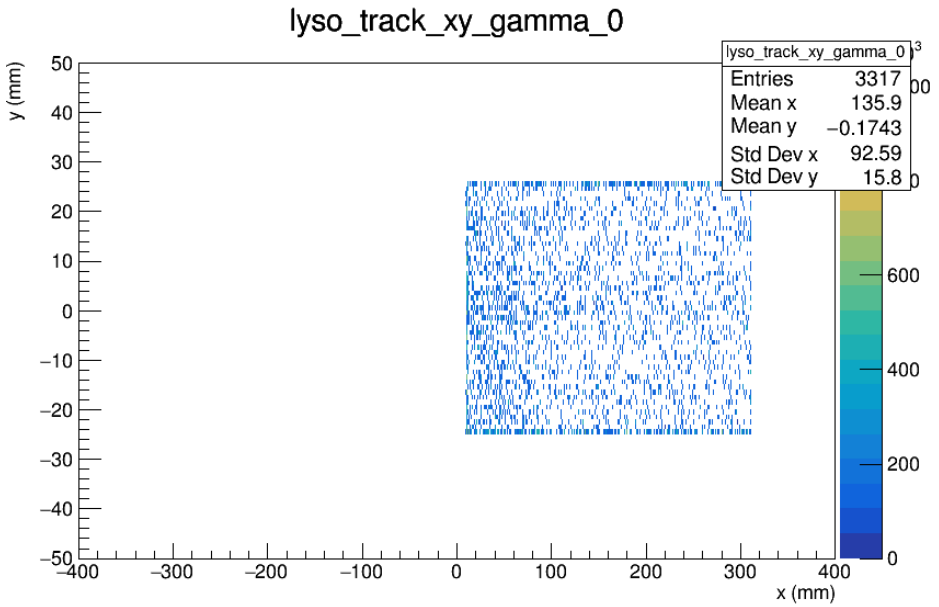


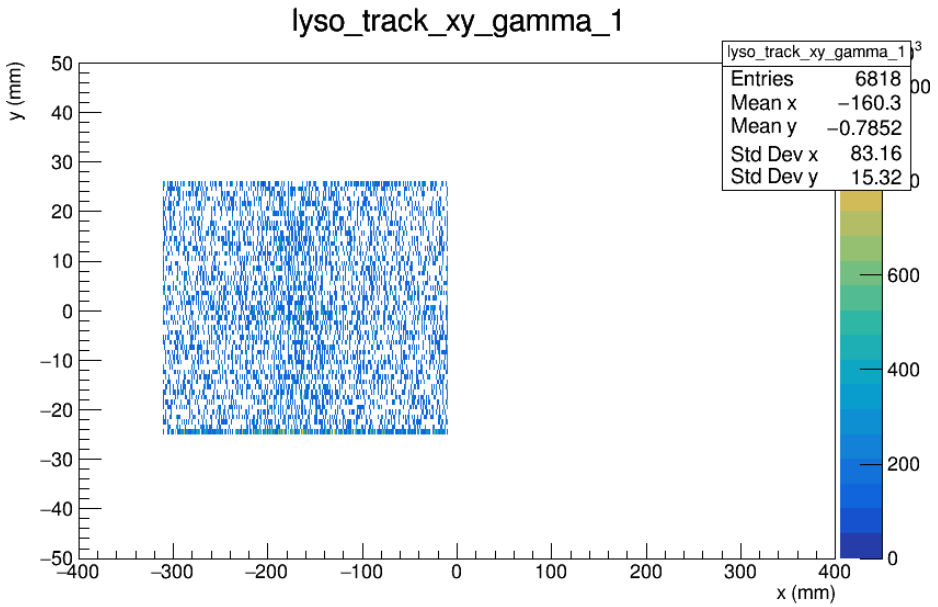


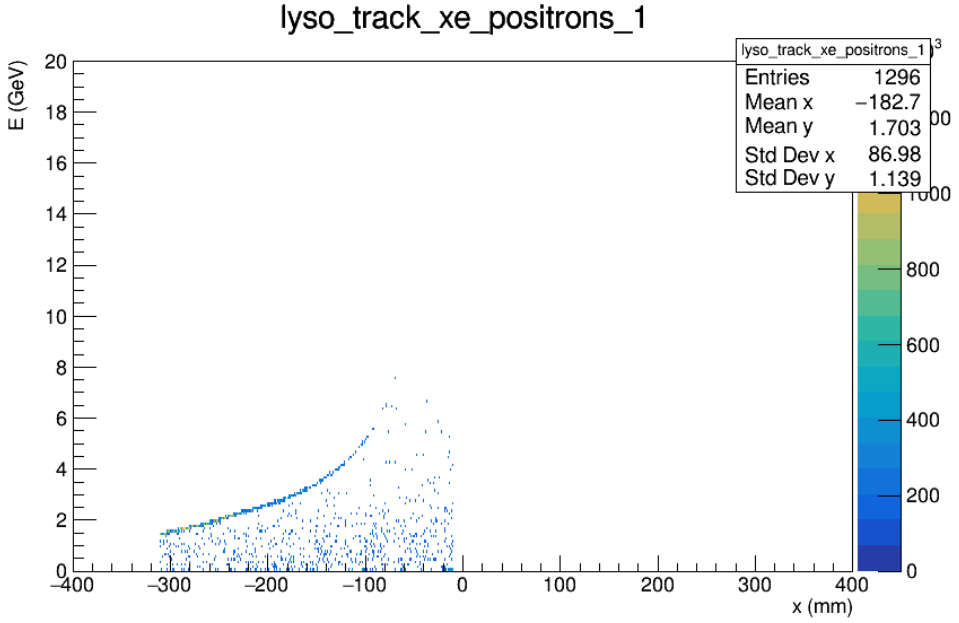


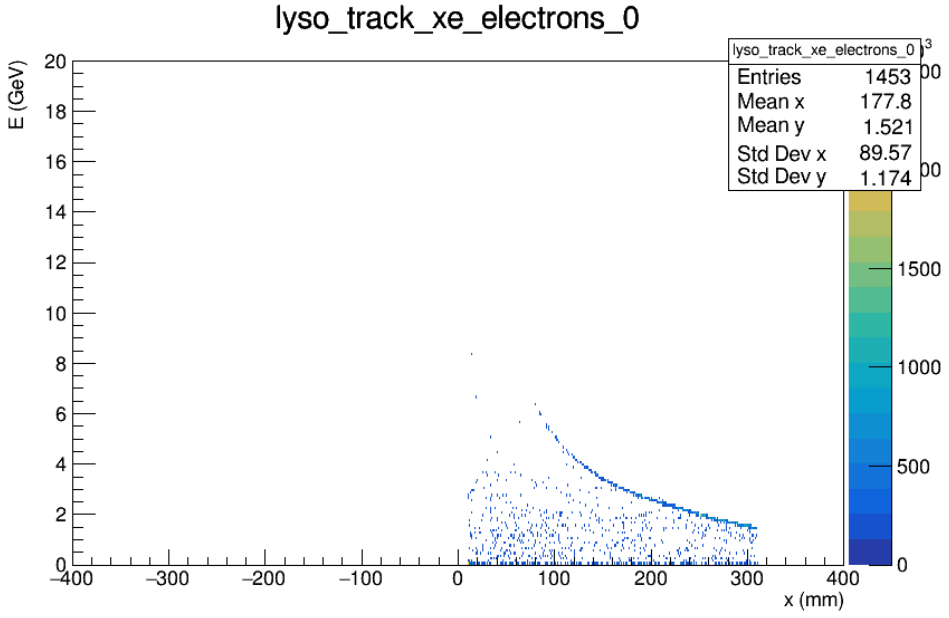


Tracks in LYSO (LANEX)

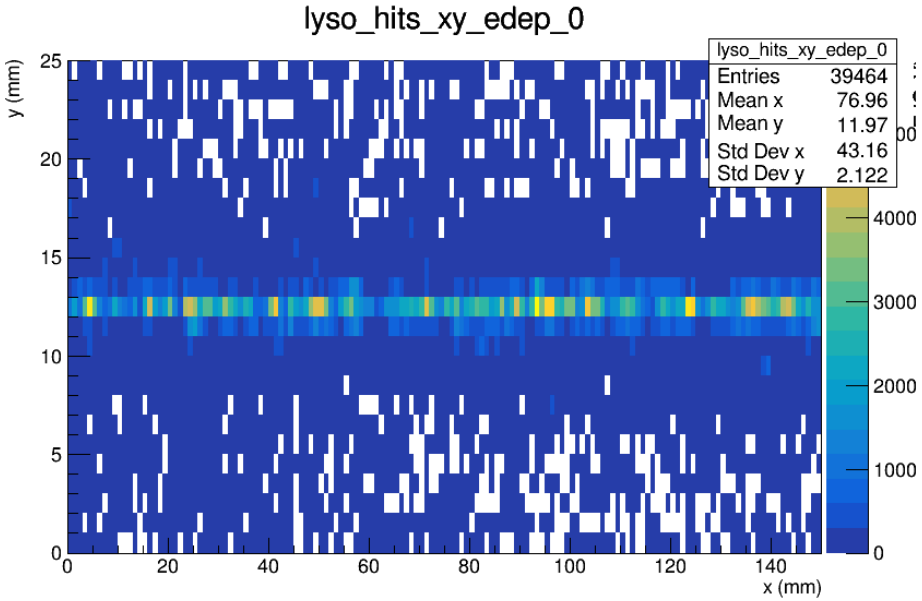


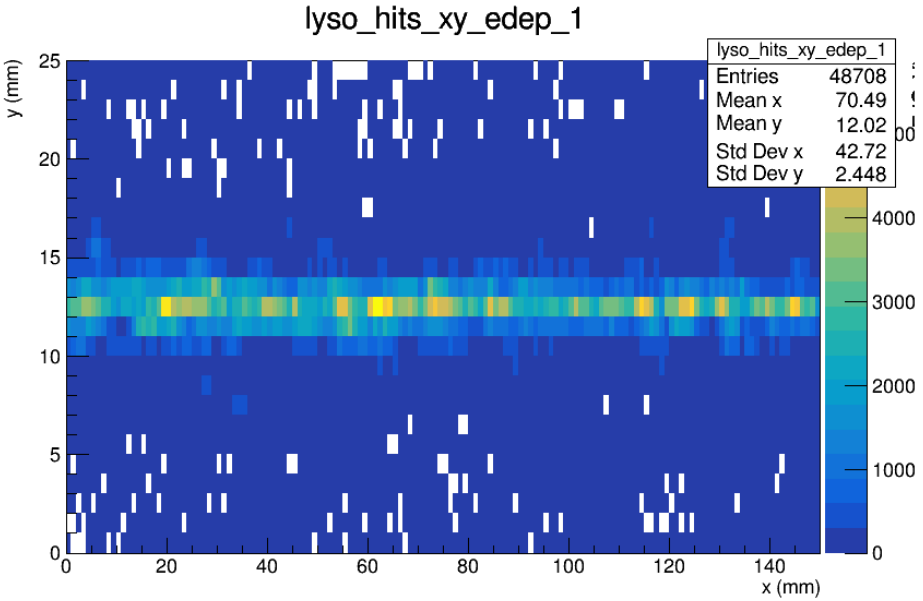




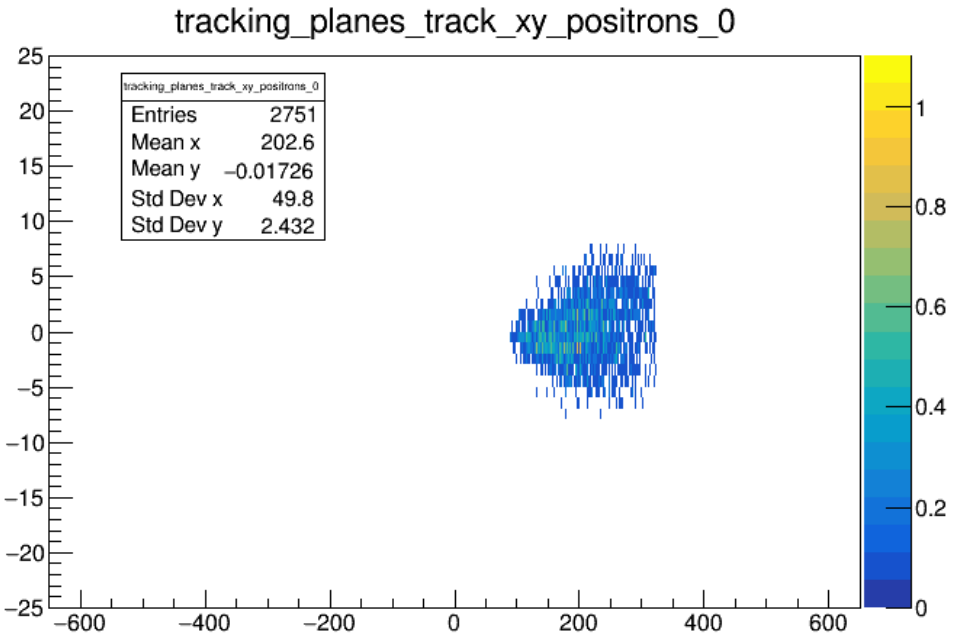


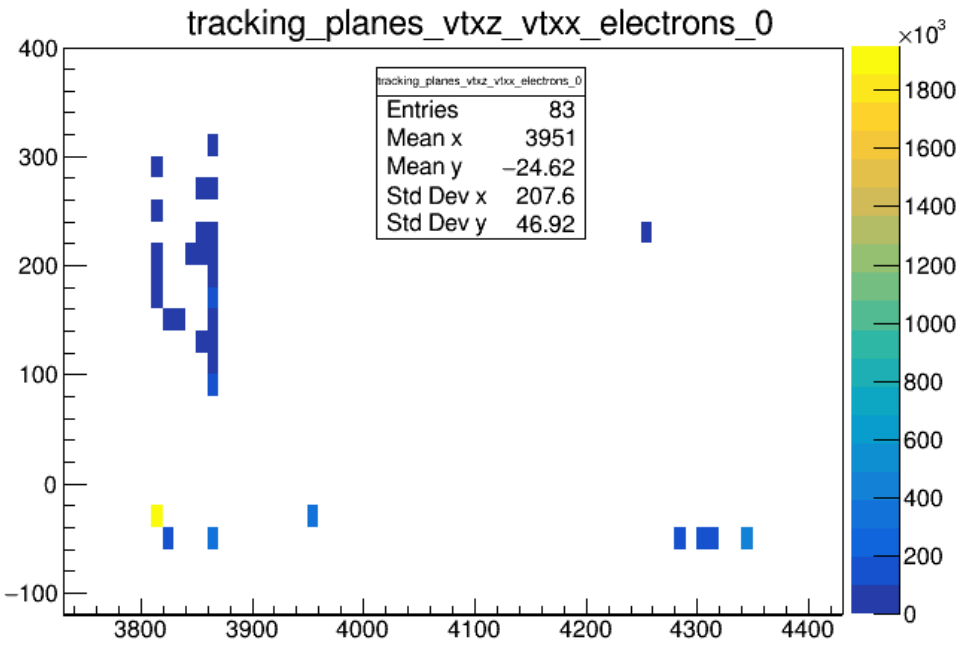
Hits in LYSO (LANEX)

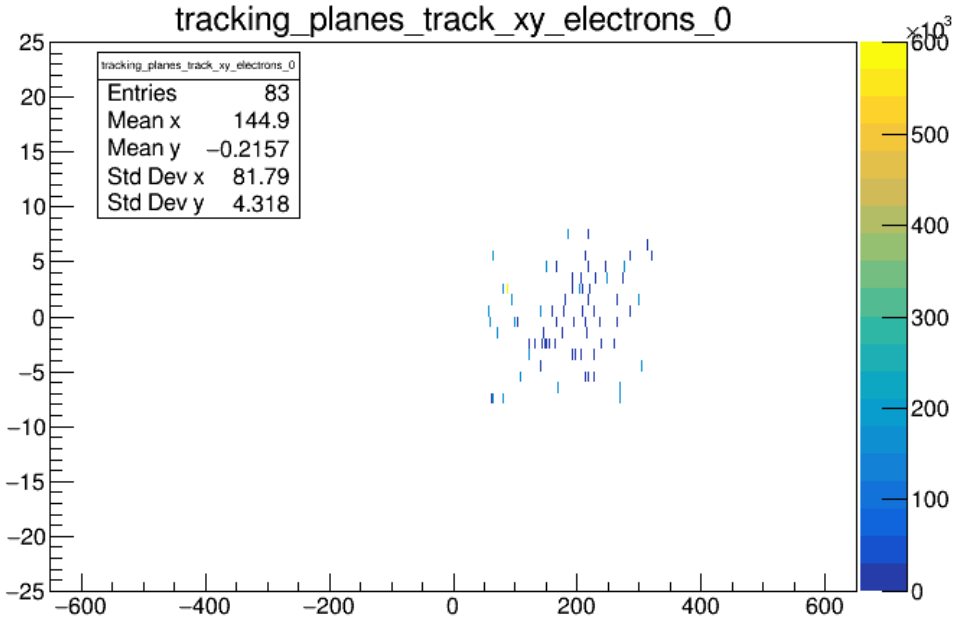


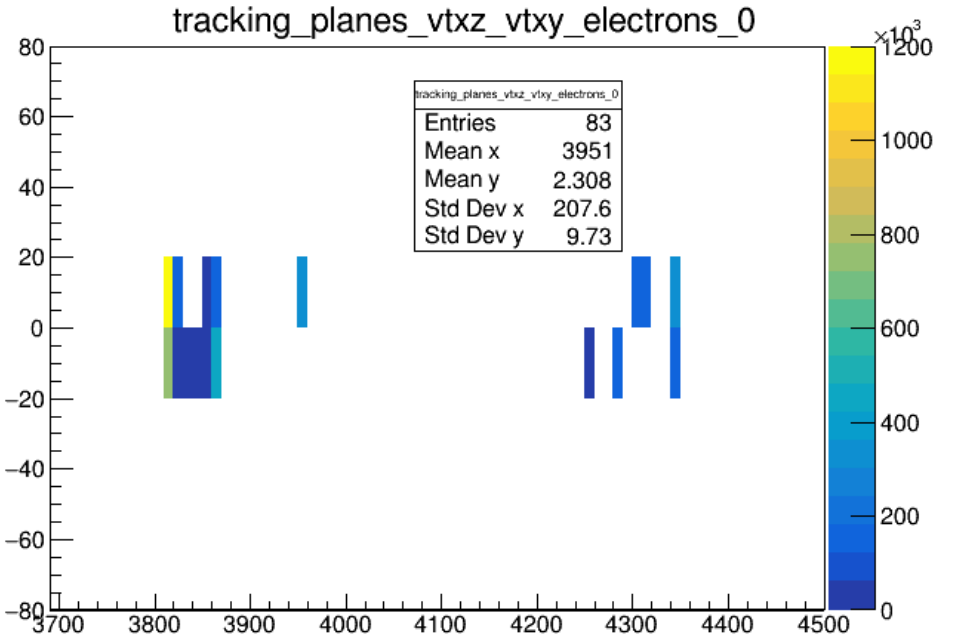


Tracker plane 0



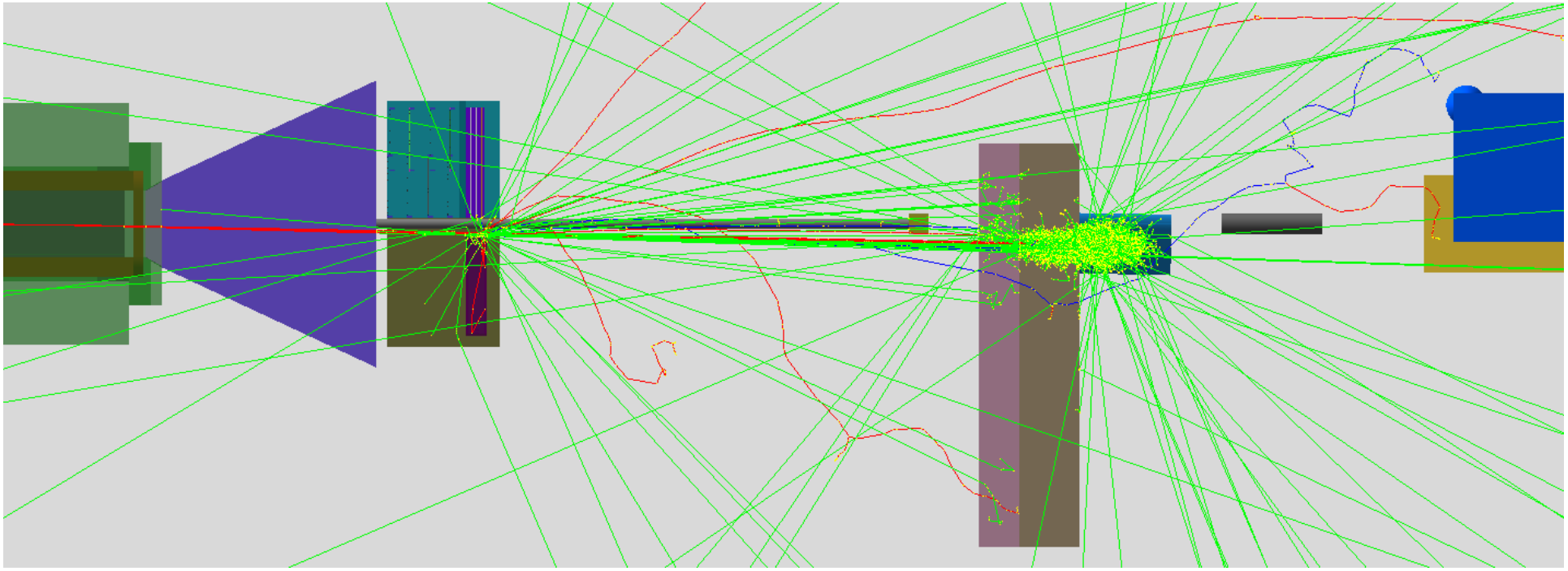


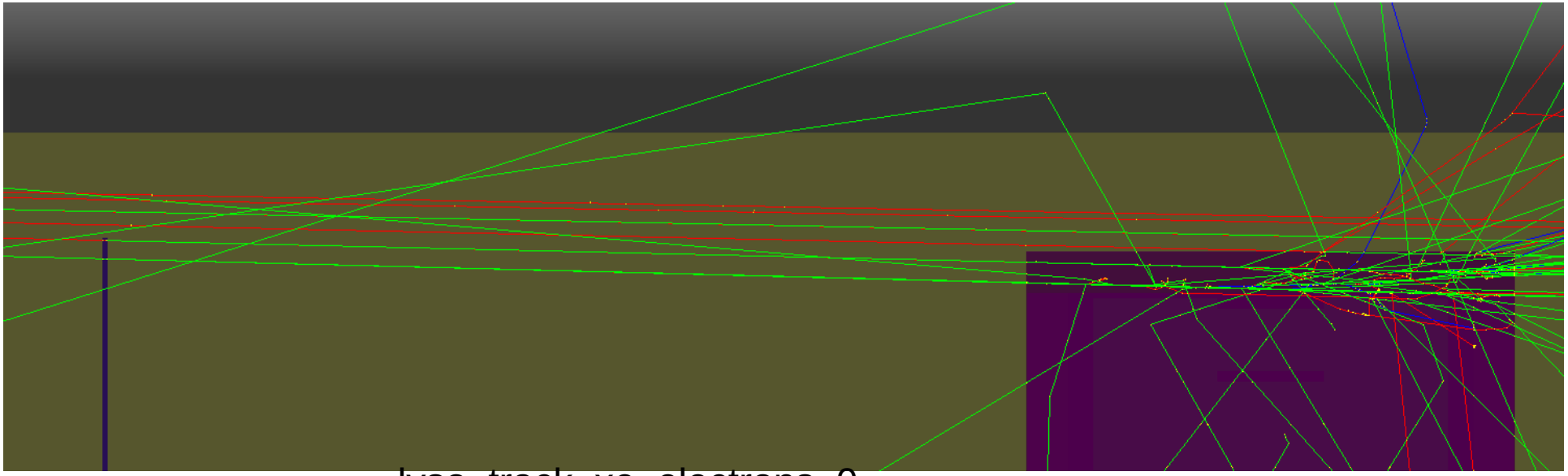




Backup

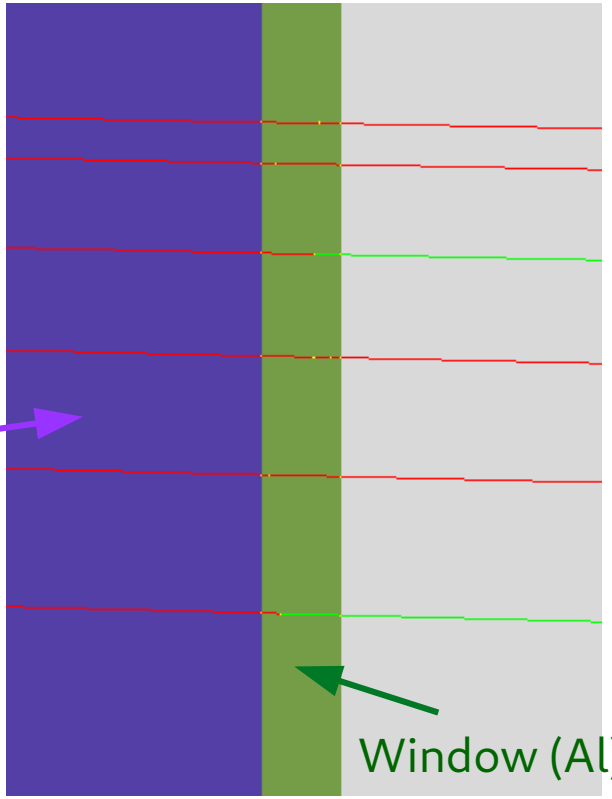
Electrons (GeV): 16.5, 16, 15, 14, 13, 12

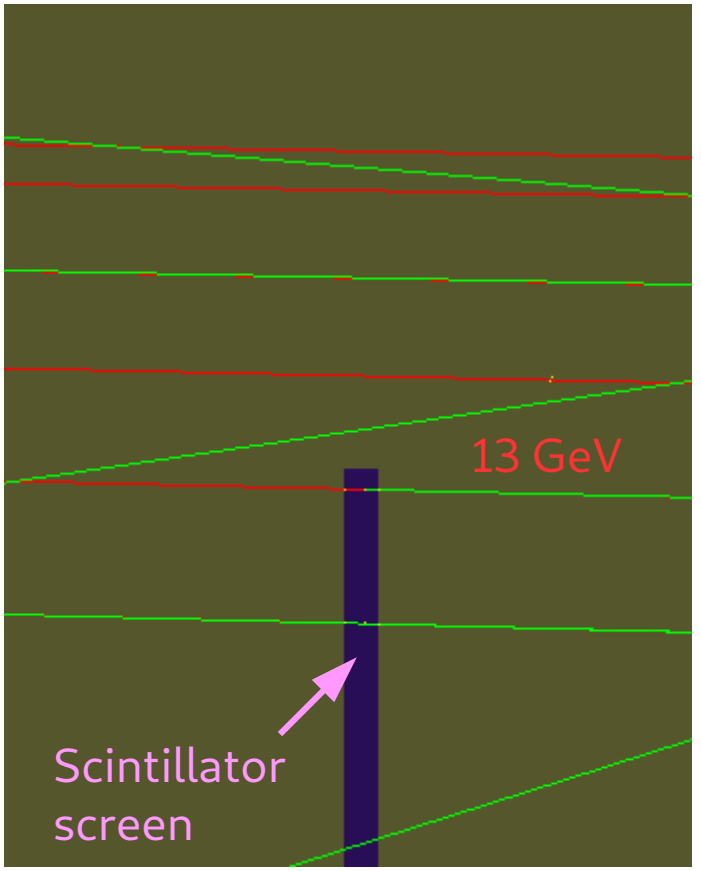


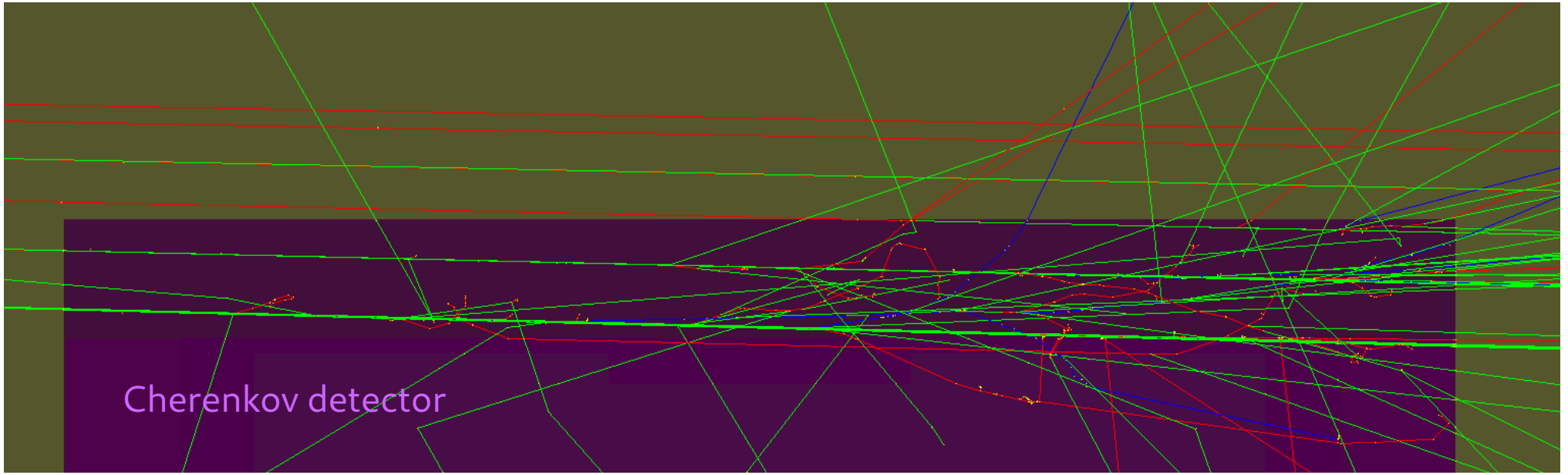


lyso_track_xe_electrons_0

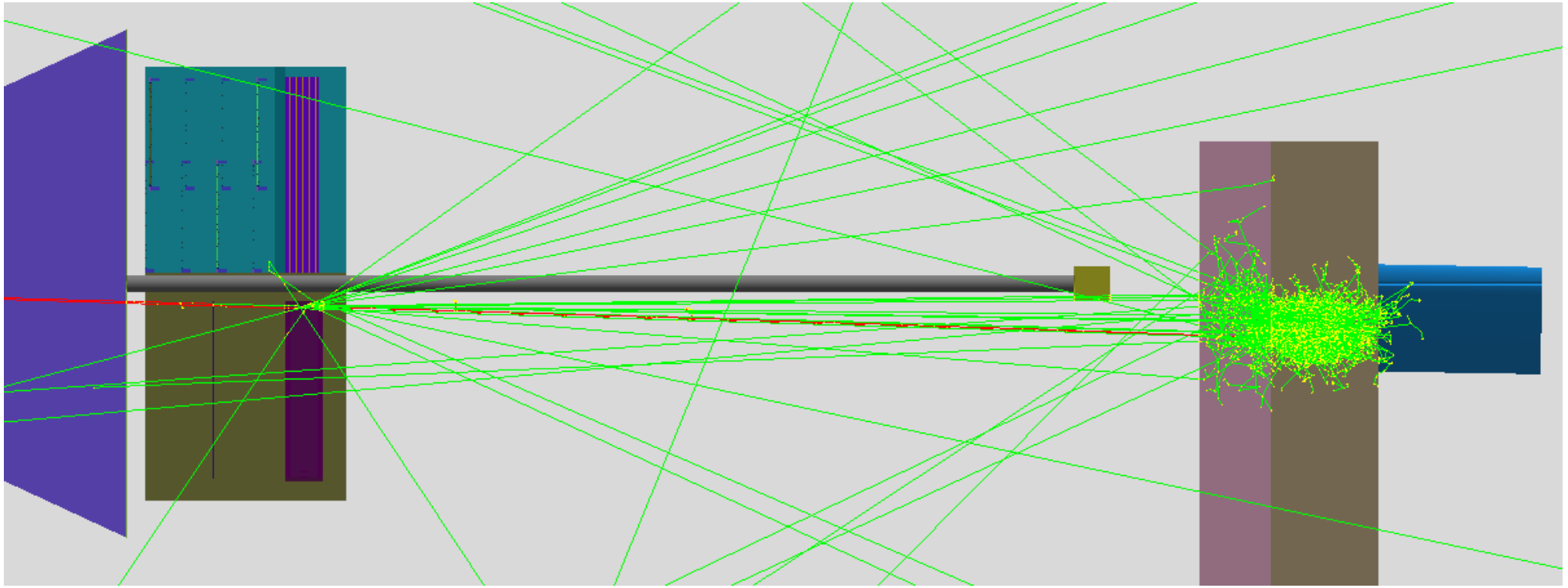
Electrons (GeV): 16.5, 16, 15, 14, 13, 12



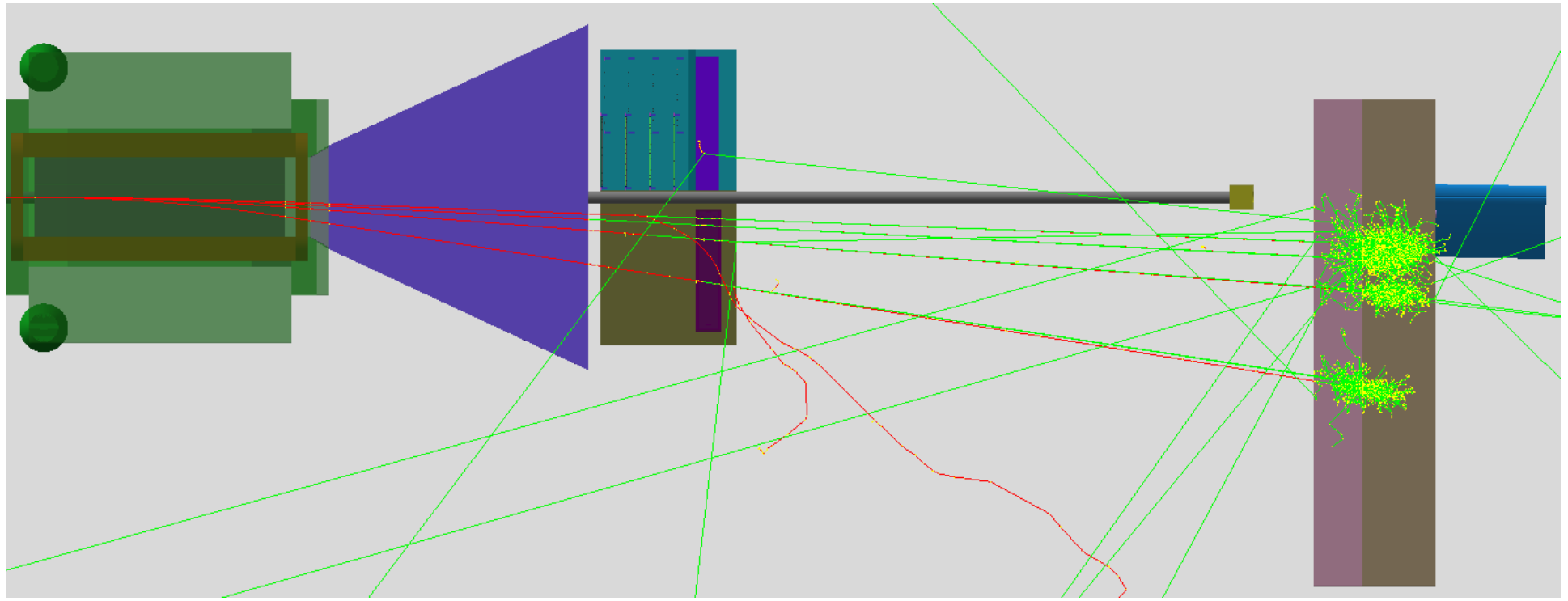


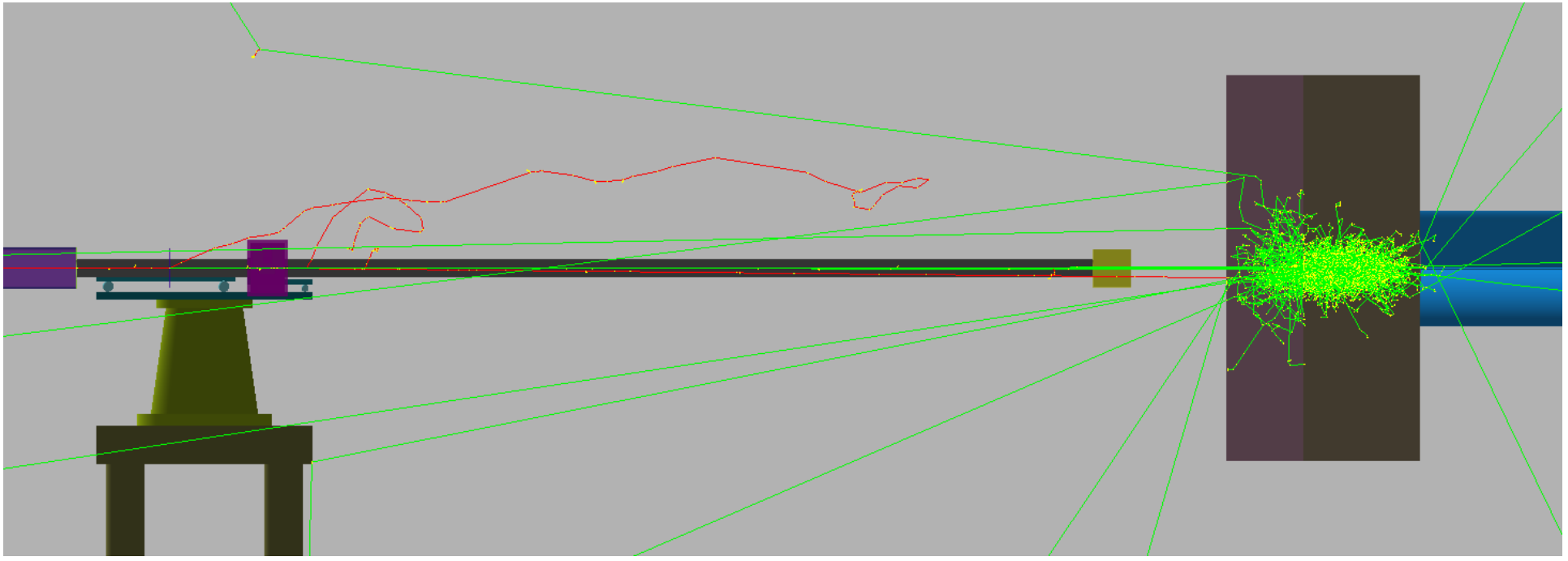


Electrons (GeV): 11, 10



Electrons (GeV): 2, 4, 6, 8





Support

Adapted from Noam's 3D CAD