Update on LUXE GEANT4 Simulation.

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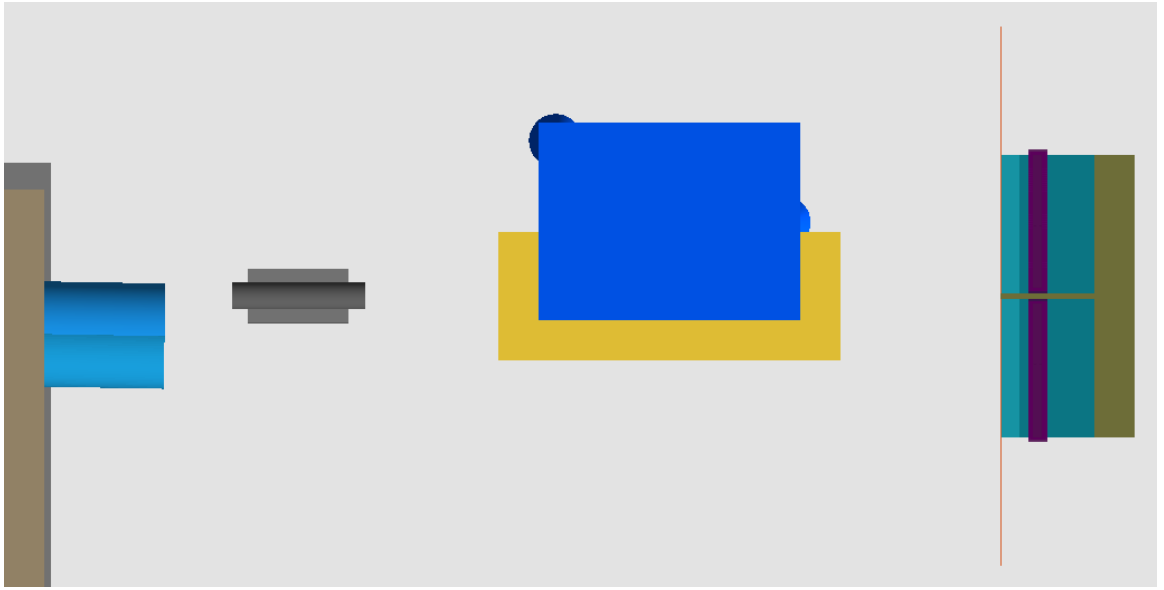
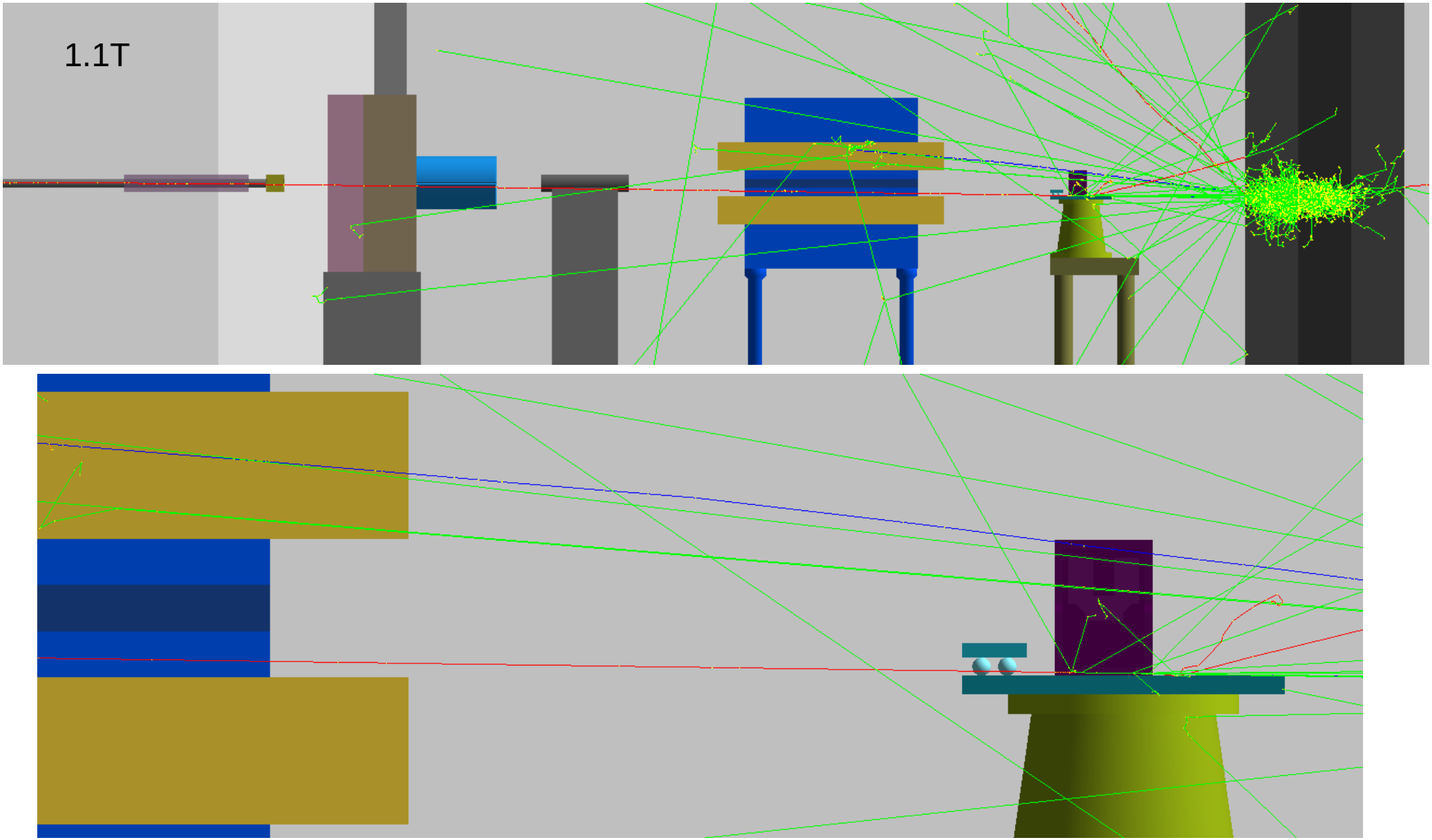
Solutions for the high background from the beam dump in HICS setup

- Copper dump (Cu radiation length 1.436 cm);
- Lead dump (Pb radiation length 0.5612 cm);
- Permanent magnet to deviate beam downward;

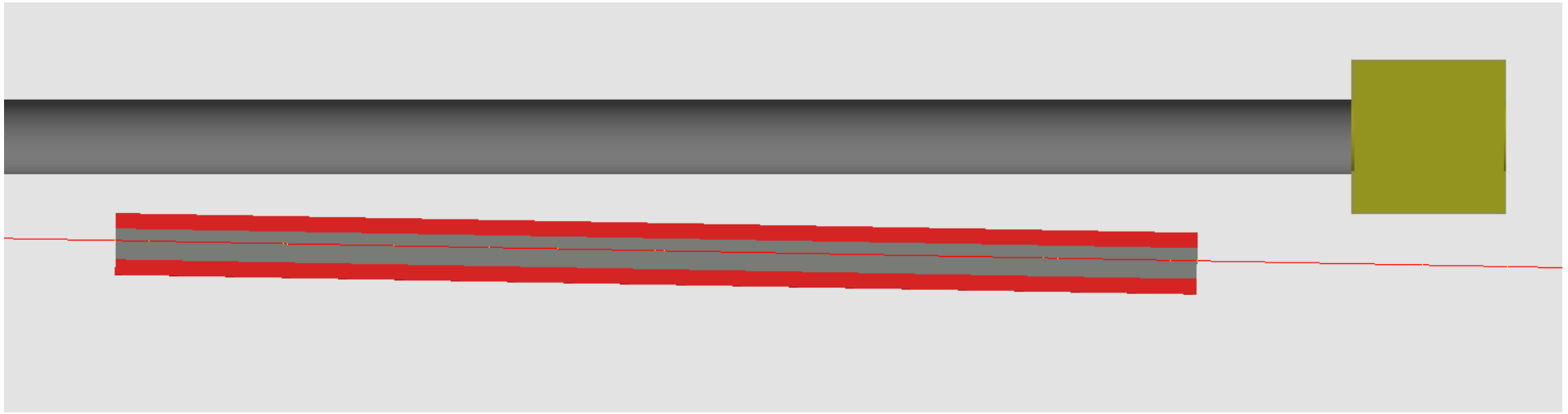
Simulation:
- Gaussian electron beam;
- 16.5 GeV;



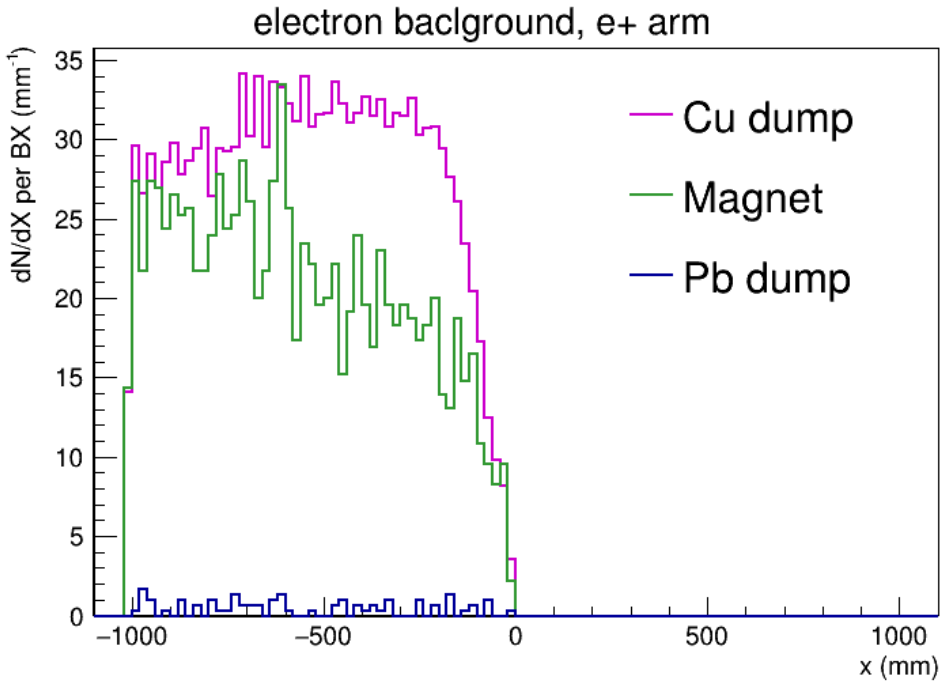
Permanent magnet implementation

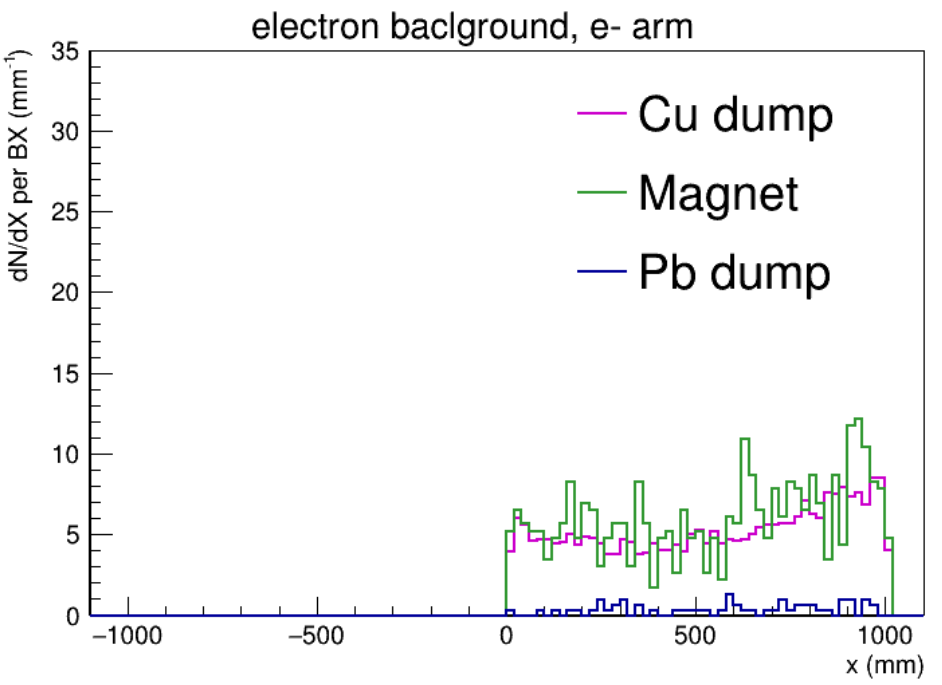


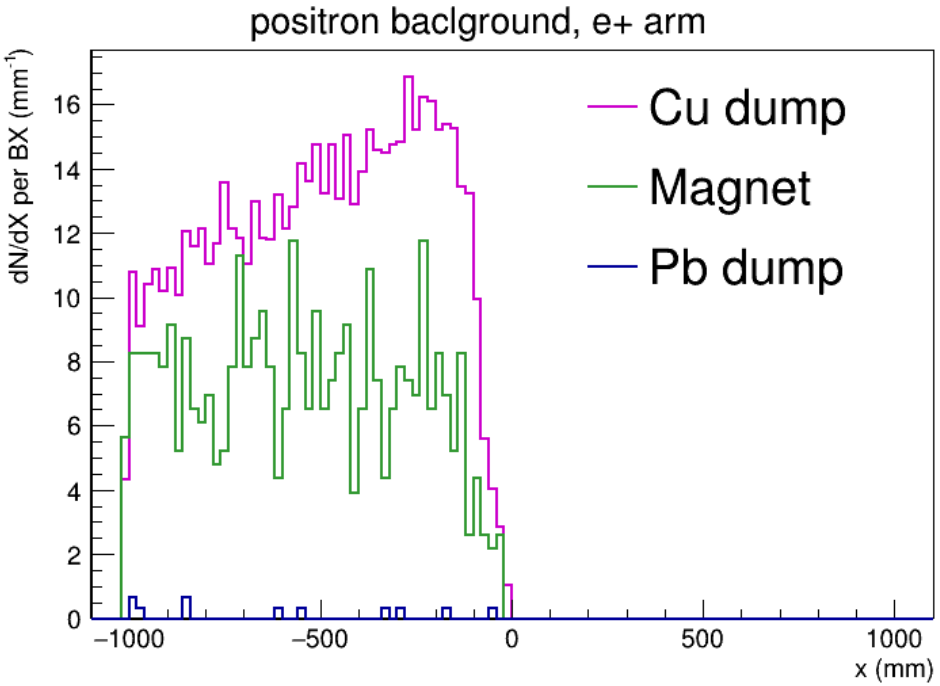
Permanent magnet implementation

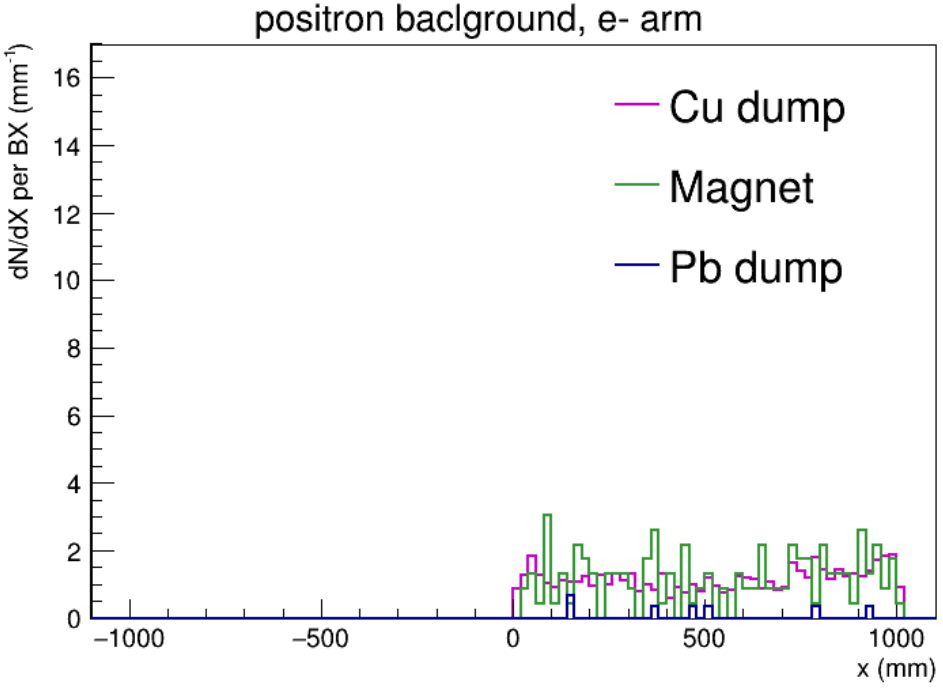


e+,e- background from dump

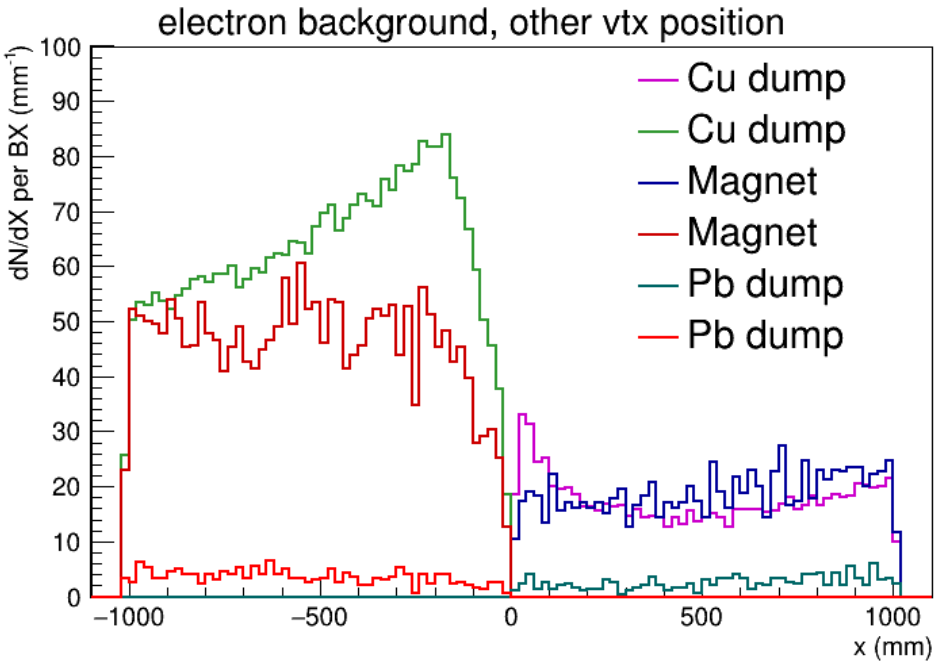


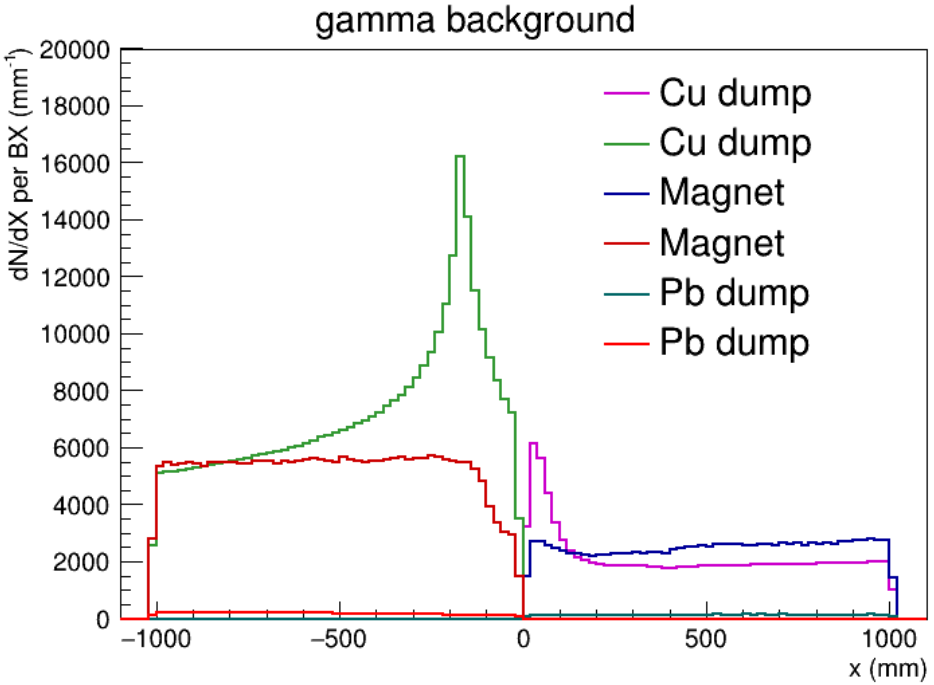


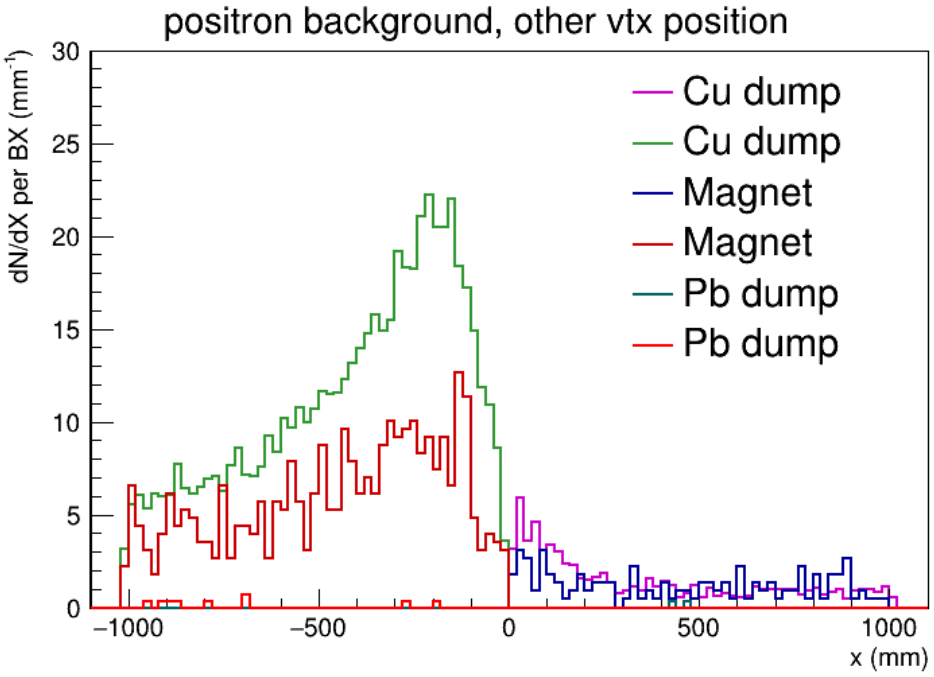




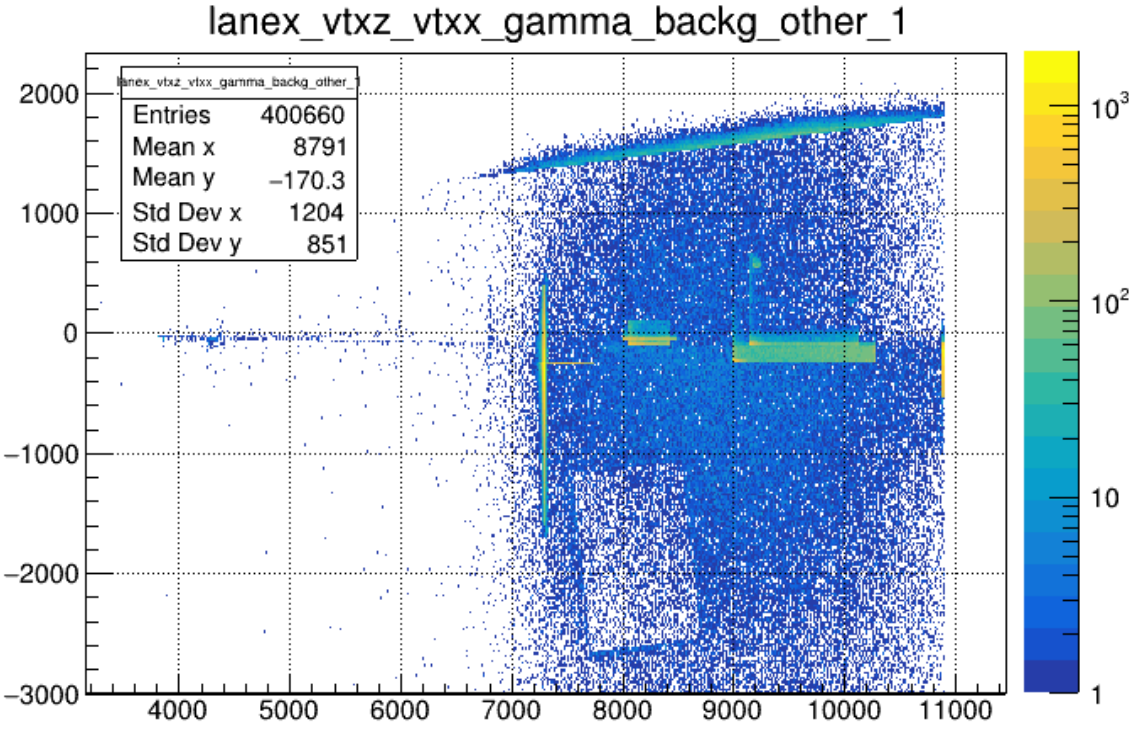
Background form “other” vertexes position

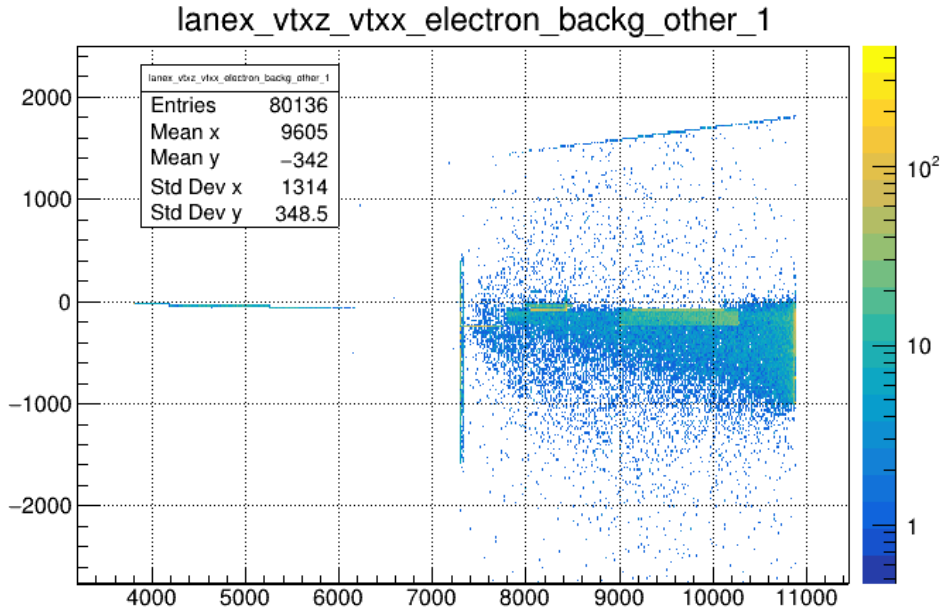


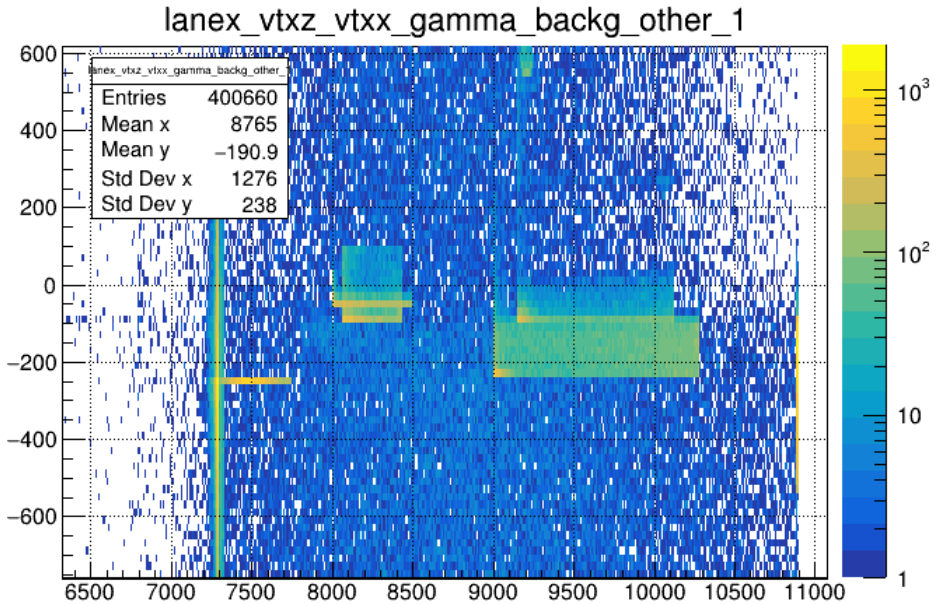




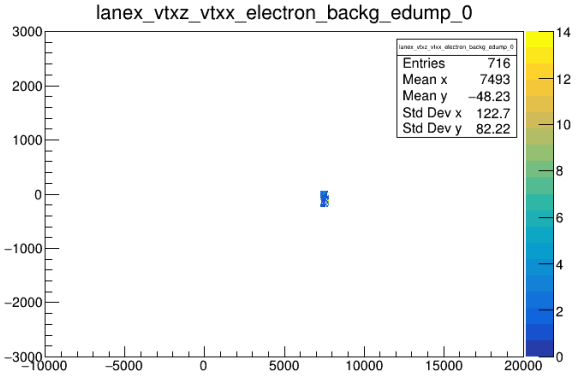
Background vertexes for regular setup (copper dump)

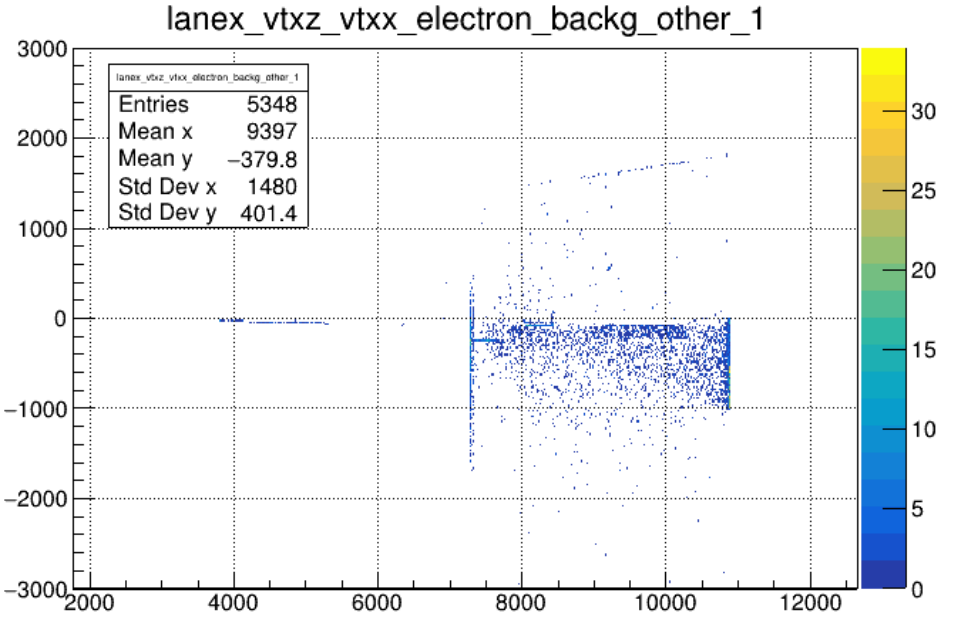


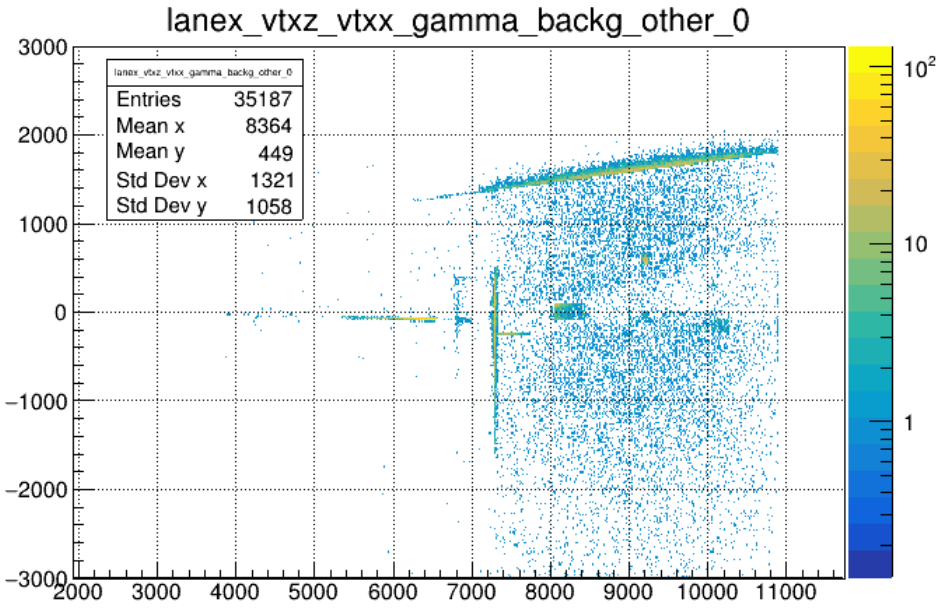


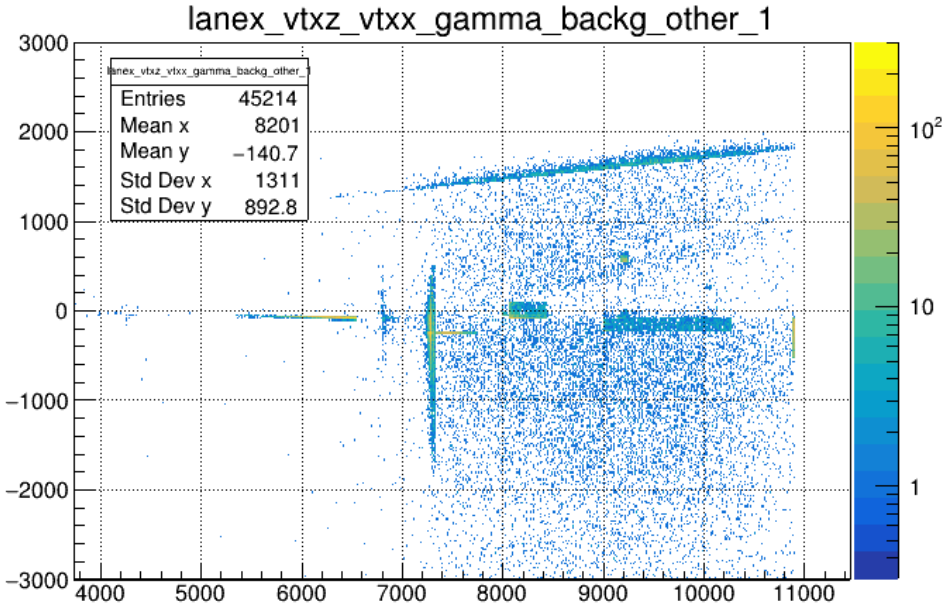


Background vertexes for setup with a magnet









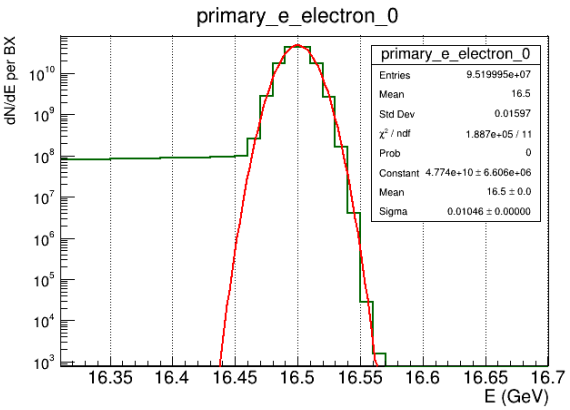
MC

https://confluence.desy.de/display/LS/GEANT4+MC

IPstrong_V1.1.00
JETI40
e_laser 16.5 GeV

MC	# MC out (BX)	Processed (BX)	Location	Notes
w0_100000nm	474	474	/nfs/dust/ilc/user/oborysov/hics_list/list_root_hics_165gev_w0_100000nm.txt	
w0_50000nm	4764	4764	/nfs/dust/ilc/user/oborysov/hics_list/list_root_hics_165gev_w0_50000nm.txt	
w0_20000nm	468	468	/nfs/dust/ilc/user/oborysov/hics_list/list_root_hics_165gev_w0_20000nm.txt	
w0_20000nm	468	468	/nfs/dust/ilc/user/oborysov/hics_list/list_root_hics_165gev_w0_20000nm_mag2t.txt	IP magnet 2T, electrons above 16.2 GeV excluded
w0_20000nm	468	468	/nfs/dust/ilc/user/oborysov/hics_list /list_root_hics_165gev_w0_20000nm_mag2t_all_particles.txt	IP magnet 2T, all primary particles are simulated
w0_10000nm	675	675	/nfs/dust/ilc/user/oborysov/hics_list/list_root_hics_165gev_w0_10000nm.txt	
w0_8000nm	9479	9479	/nfs/dust/ilc/user/oborysov/hics_list/list_root_hics_165gev_w0_8000nm.txt	
w0_3000nm	9508	9508	/nfs/dust/ilc/user/oborysov/hics_list/list_root_hics_165gev_w0_3000nm.txt	
w0_3000nm	9508	9113	/nfs/dust/ilc/user/oborysov/hics_list/list_root_hics_165gev_w0_3000nm_mag2t.txt	IP magnet 2T, electrons above 16.4 GeV excluded
w0_50000nm	4764	4720	/nfs/dust/ilc/user/oborysov/hics_list/list_root_hics_165gev_w0_50000nm_mag2t.txt	IP magnet 2T, electrons above 16.4 GeV excluded
w0_50000nm	4764	4724	/nfs/dust/ilc/user/oborysov/hics_list/list_root_hics_165gev_w0_50000nm_mag2t_all.txt	IP magnet 2T with all particles simulated

w0_3000nm



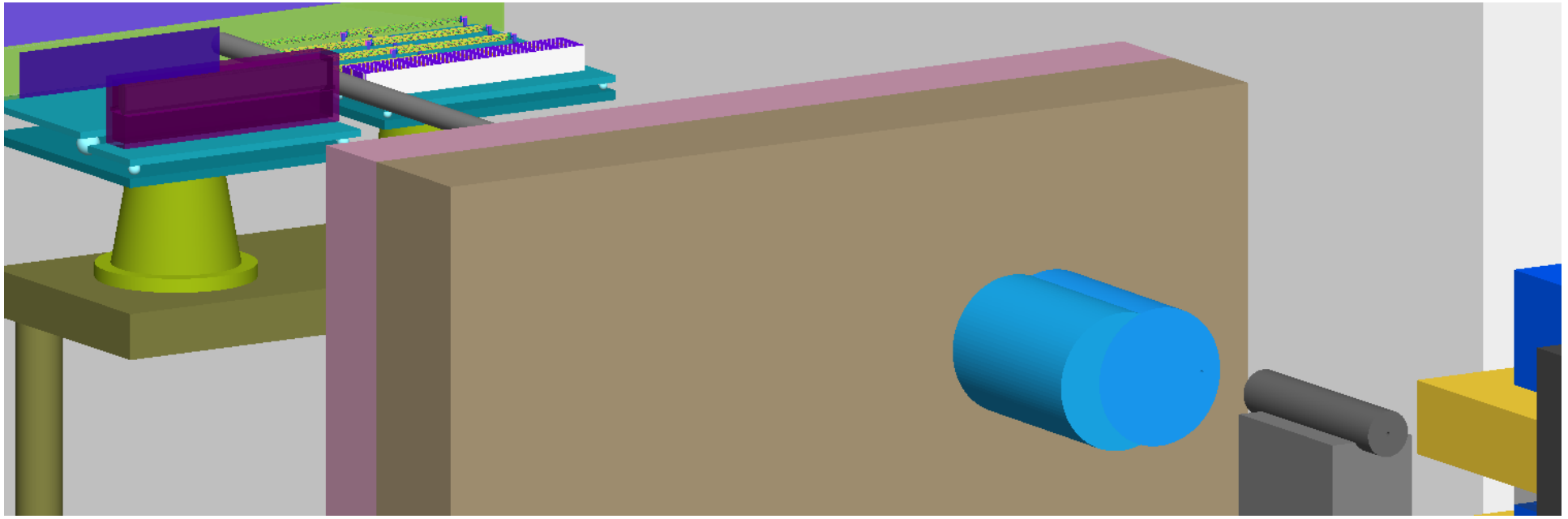
IPstrong_V1.1.00
Phase II
e_laser 16.5 GeV

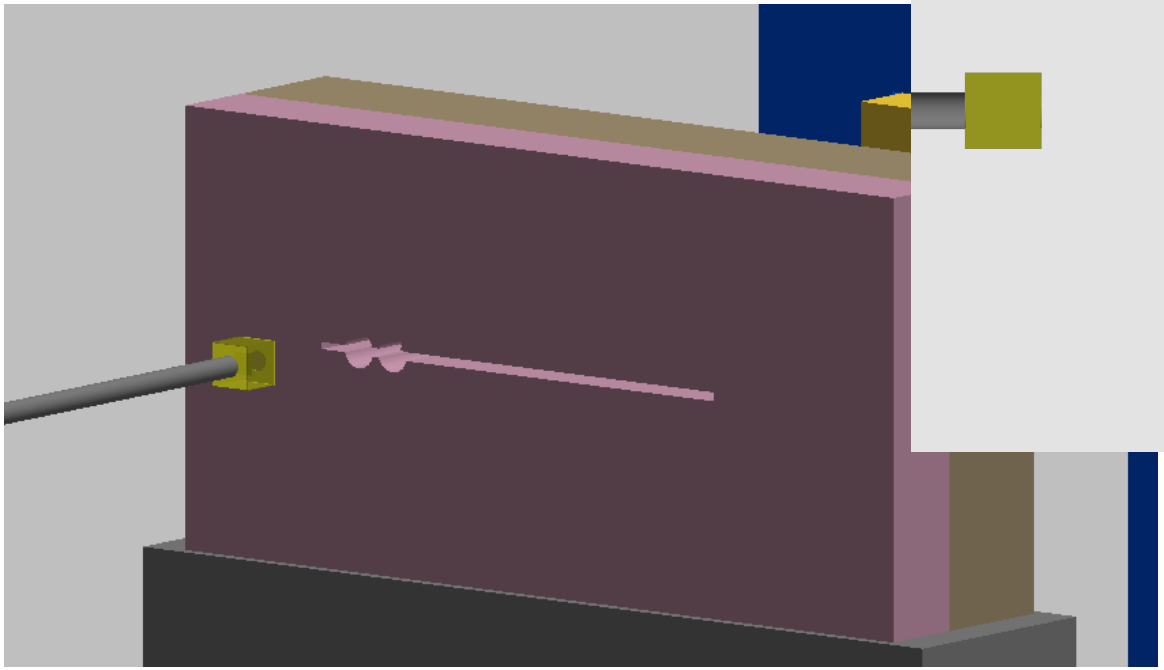
MC	# MC out (BX)	Processed (BX)	Location	Notes
w0_8000nm	941	941	/nfs/dust/ilc/user/oborysov/hics_list/list_root_hics_phase2_165gev_w0_8000nm.txt	
w0_9000nm	951	951	/nfs/dust/ilc/user/oborysov/hics_list/list_root_hics_phase2_165gev_w0_9000nm.txt	

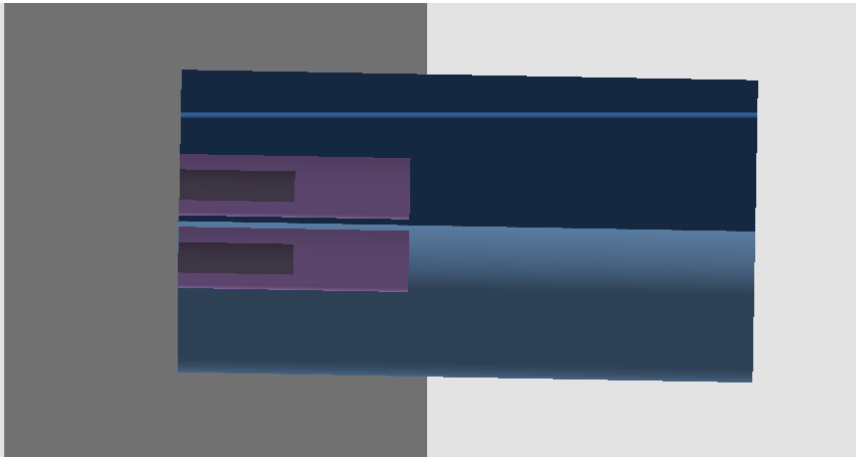
Background 16.5 GeV

Simulation	# particles	Processed (BX)	Location	Notes
Electron background for electron-laser setup	1.89e9	1.259	/nfs/dust/luxe/group/MCProduction/Background/elaser/29102020_lx86a1/Merged /Files/	Setup corresponds to commit 86a153 (hics branch)
Background for gamma-laser setup	7.53e9	5.022	/nfs/dust/luxe/group/MCProduction/Background/gammalaser/09102020_lxb18e /Merged/Files	Setup corresponds to commit b18e55ec (master branch)

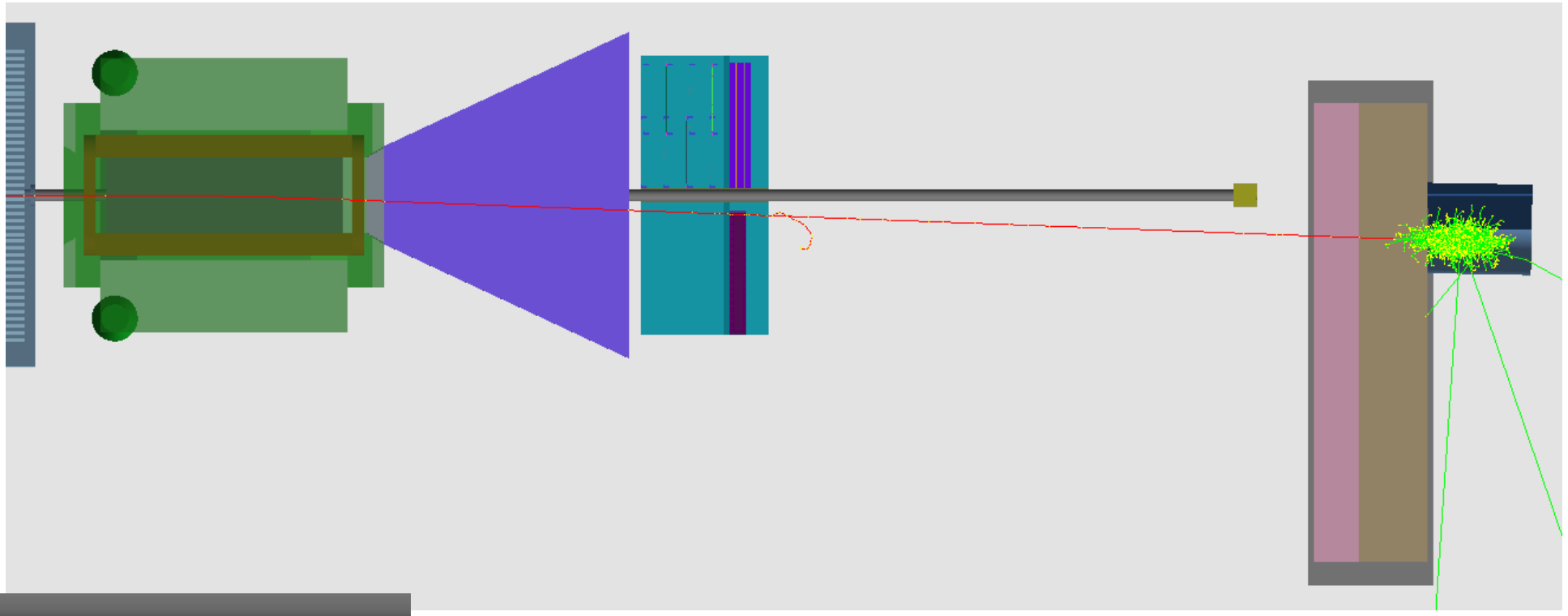
Beam dump for 1T and 2T setup

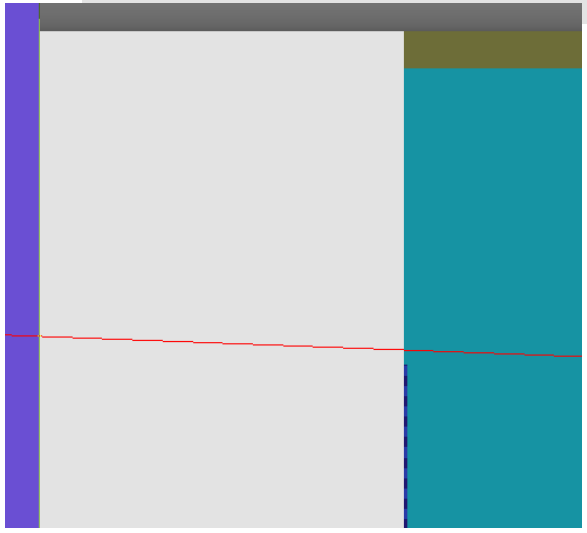


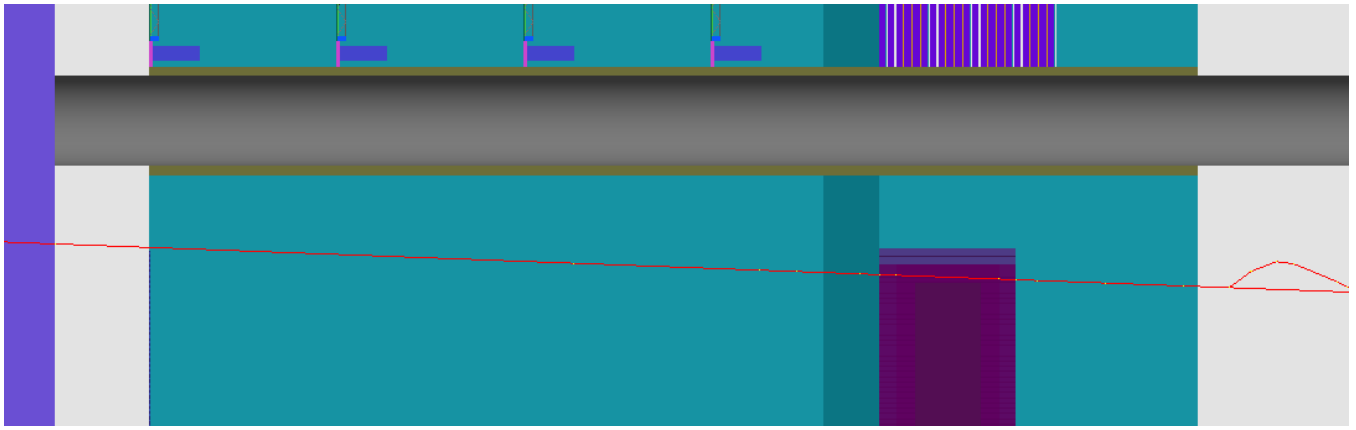




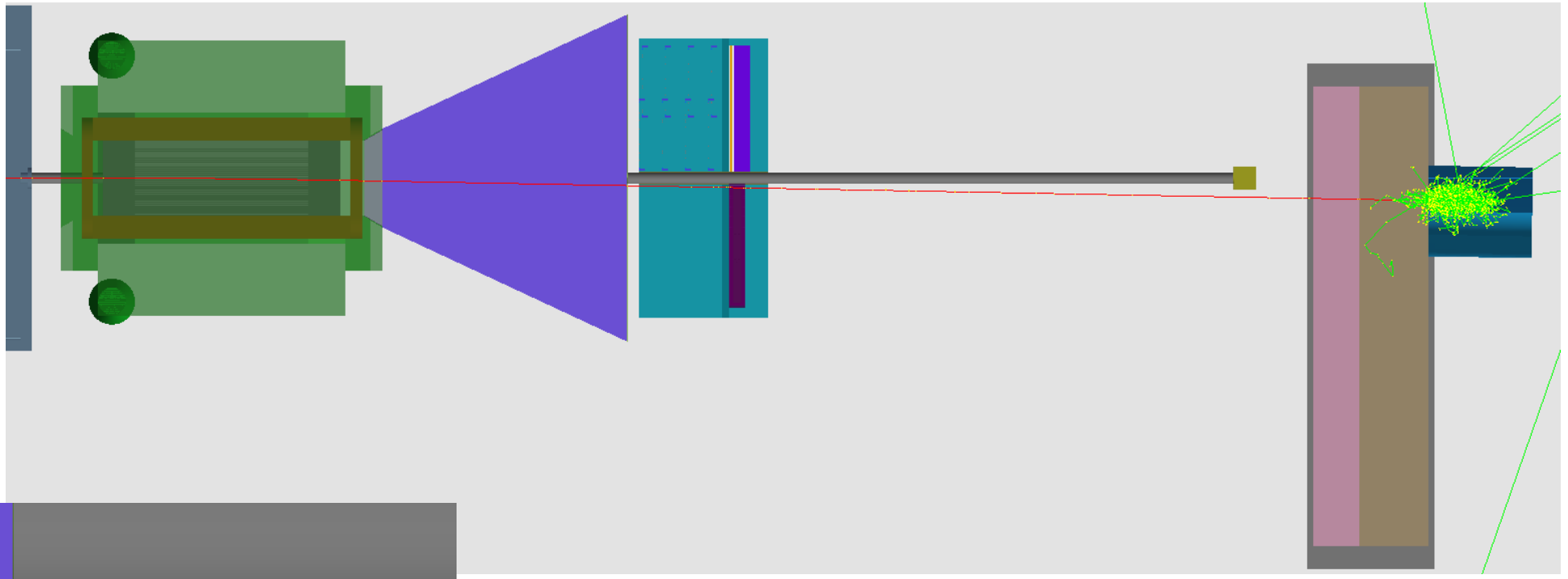
2 T setup

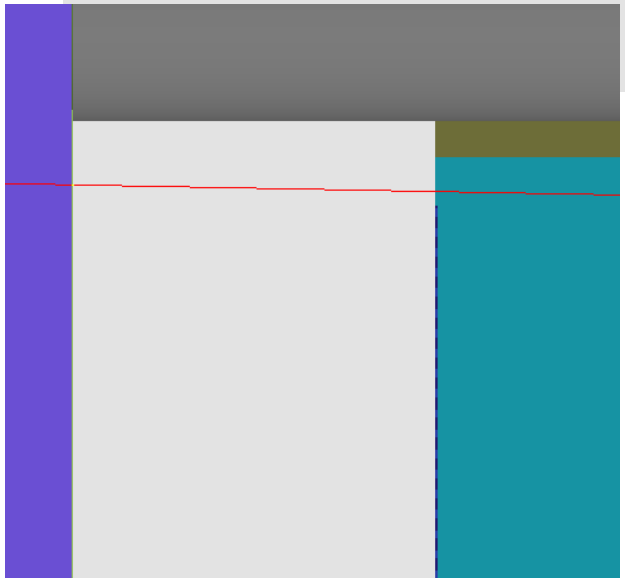


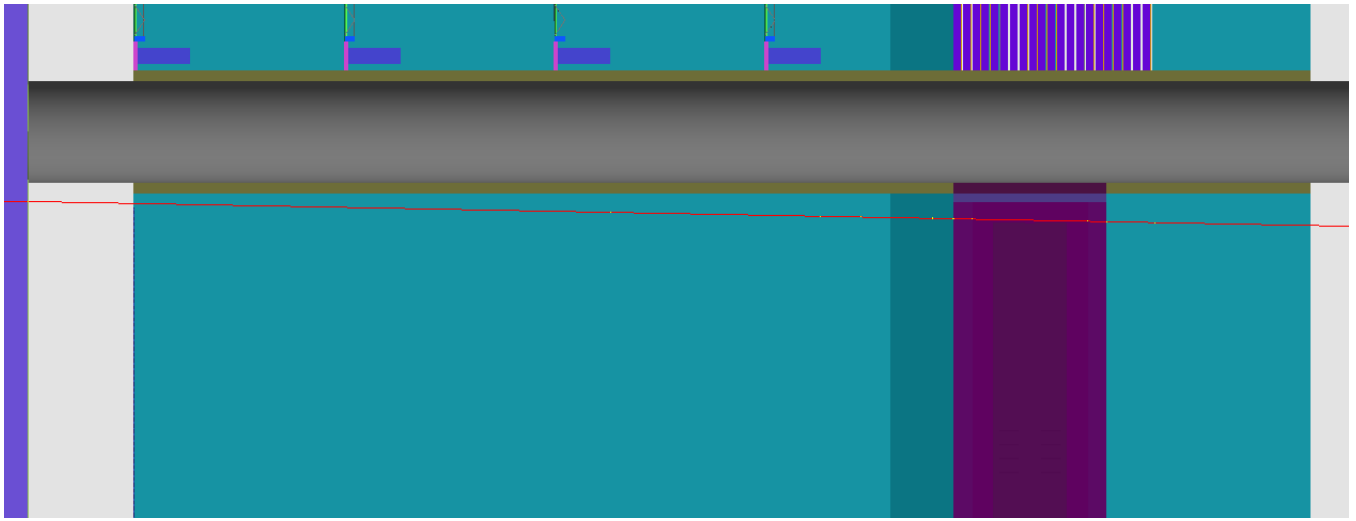




1 T setup

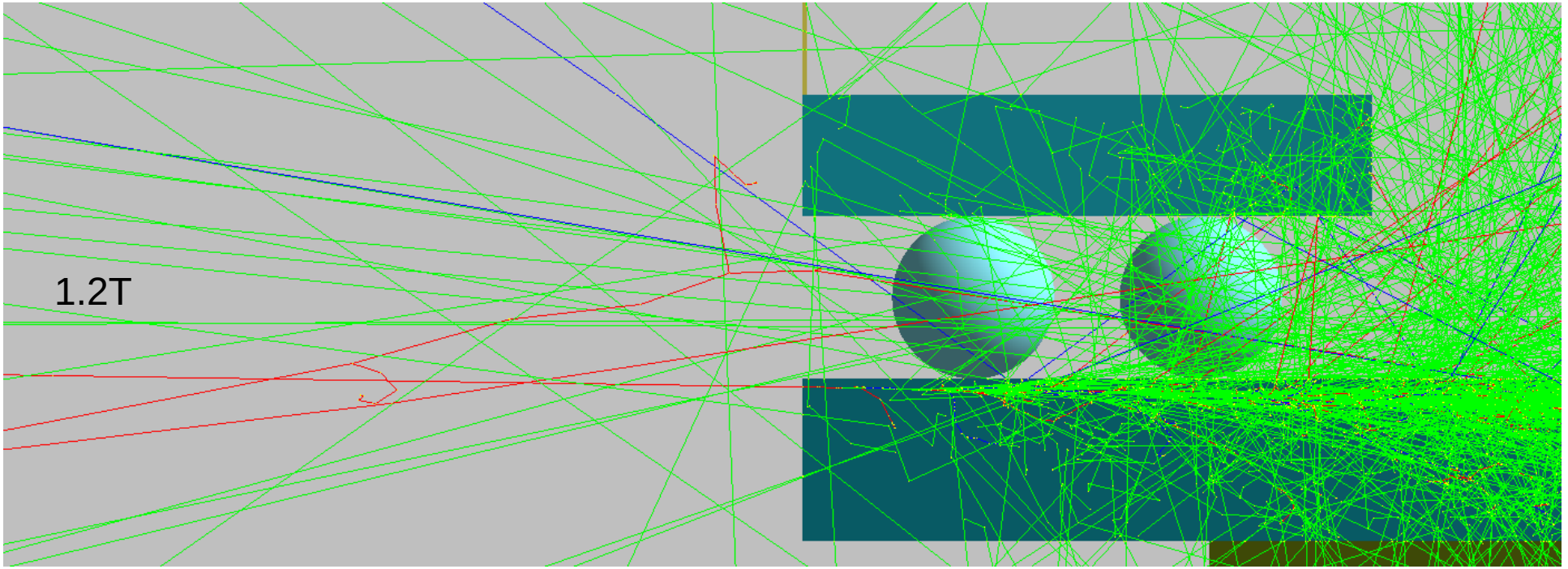


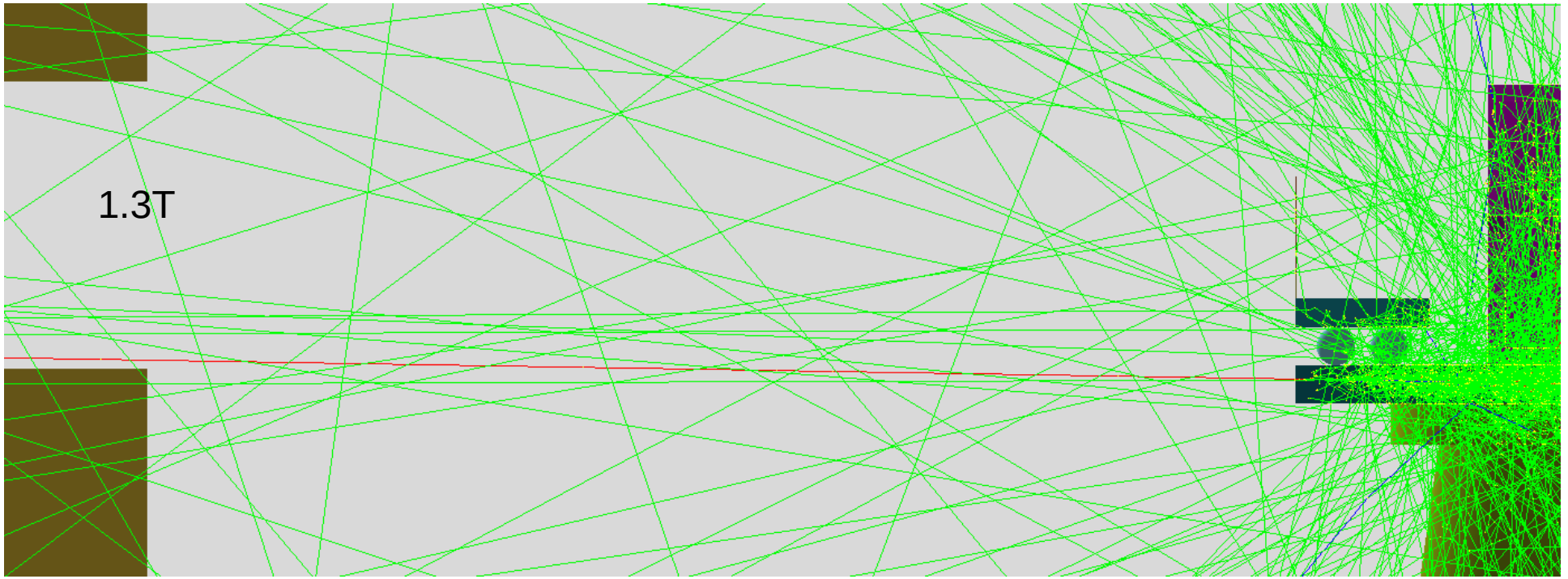




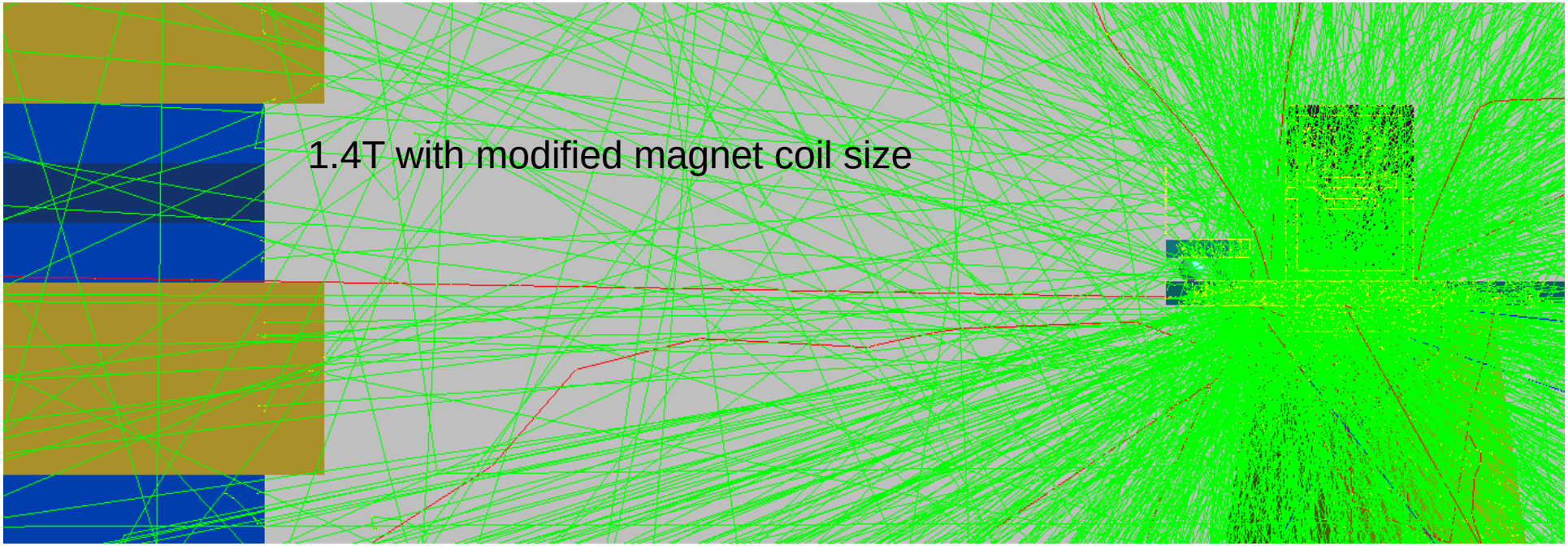
Backup

Permanent magnet implementation

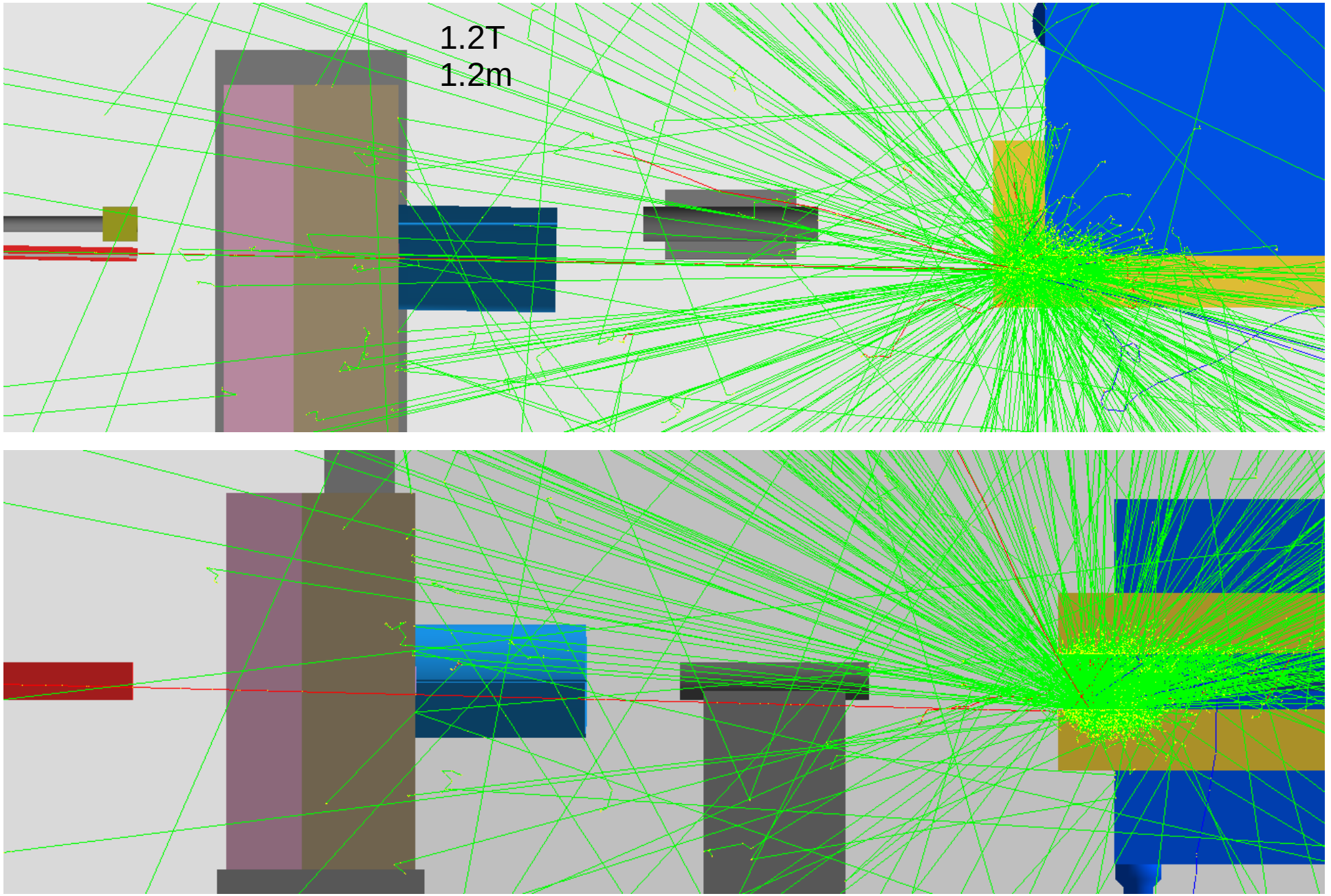




Permanent magnet implementation



Permanent magnet implementation



Permanent magnet implementation

1.2T
1.2m