Update on LUXE GEANT4 Simulation

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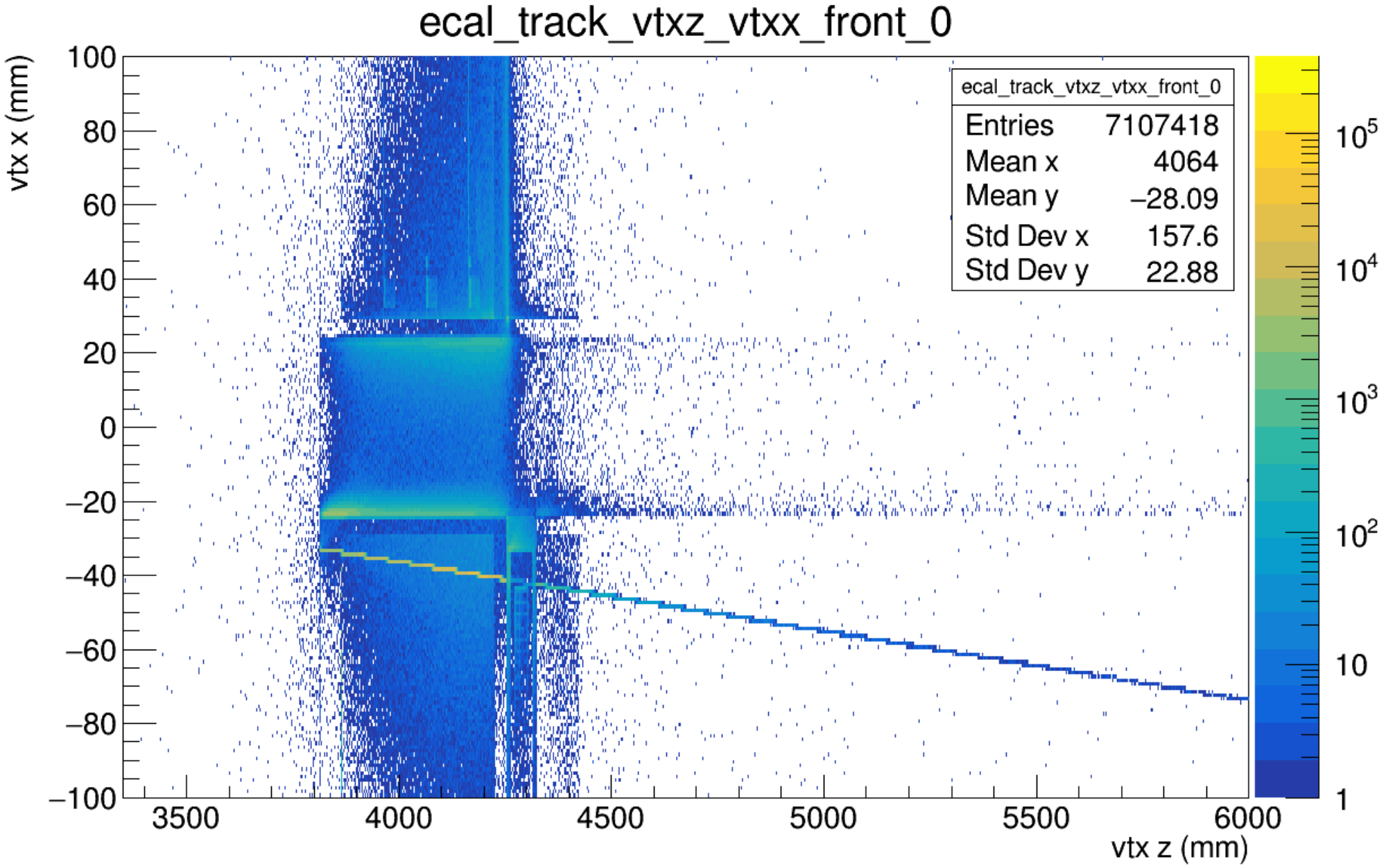
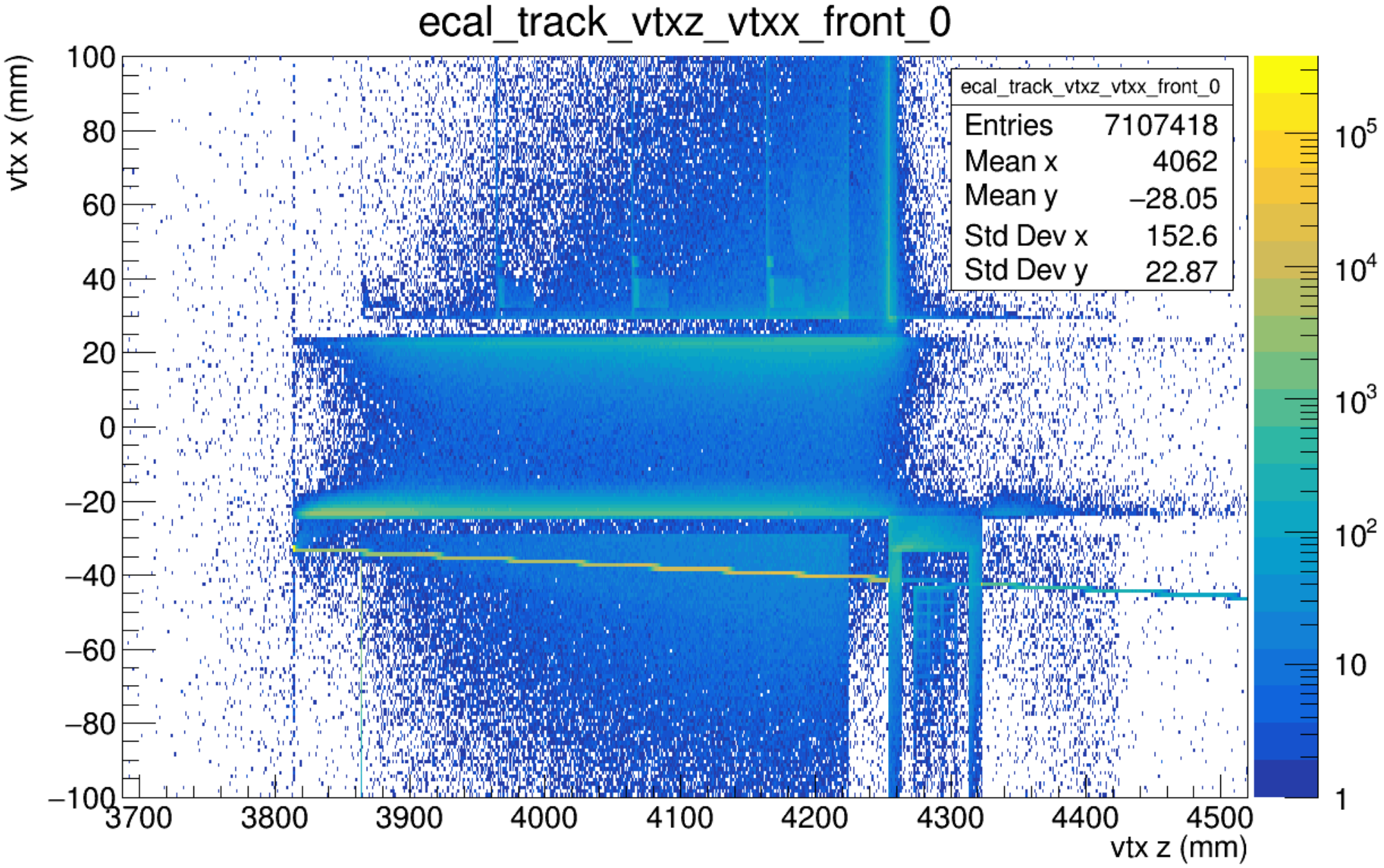
Vertex (z,x) for tracks hitting the front plane of ECAL

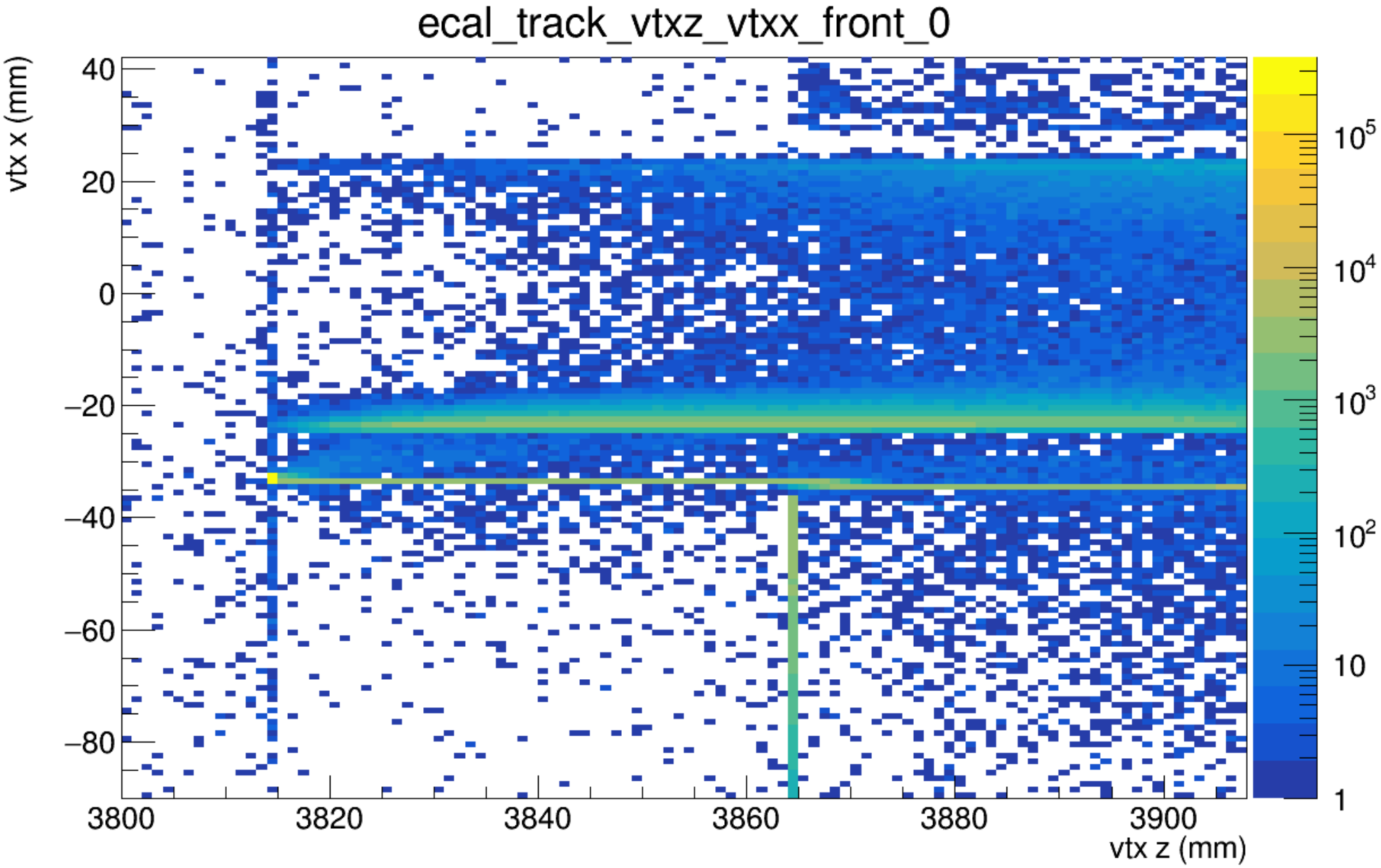
5.64E+10 electrons ~37.61 BX



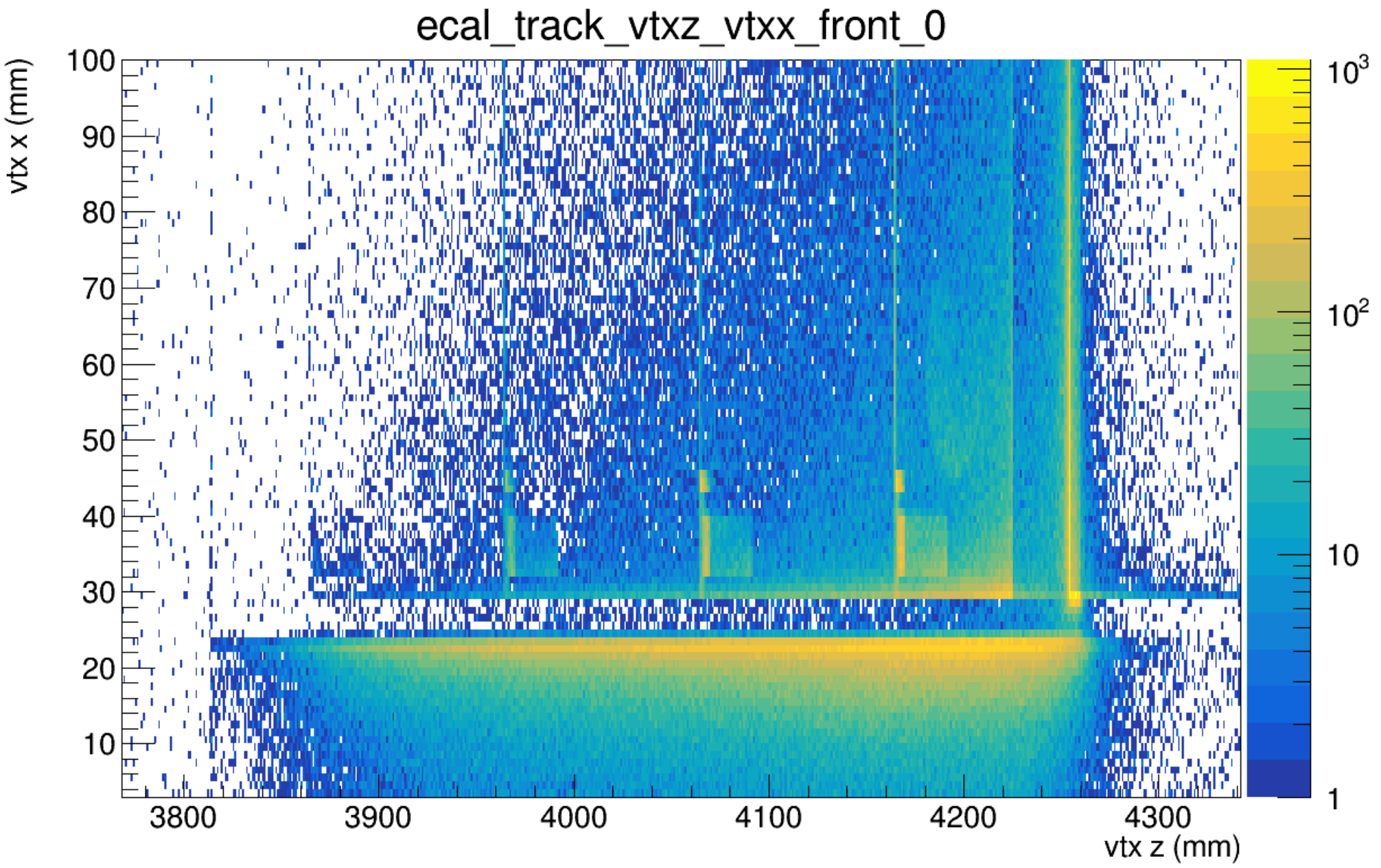
Vertex (z,x) for tracks hitting the front plane of ECAL



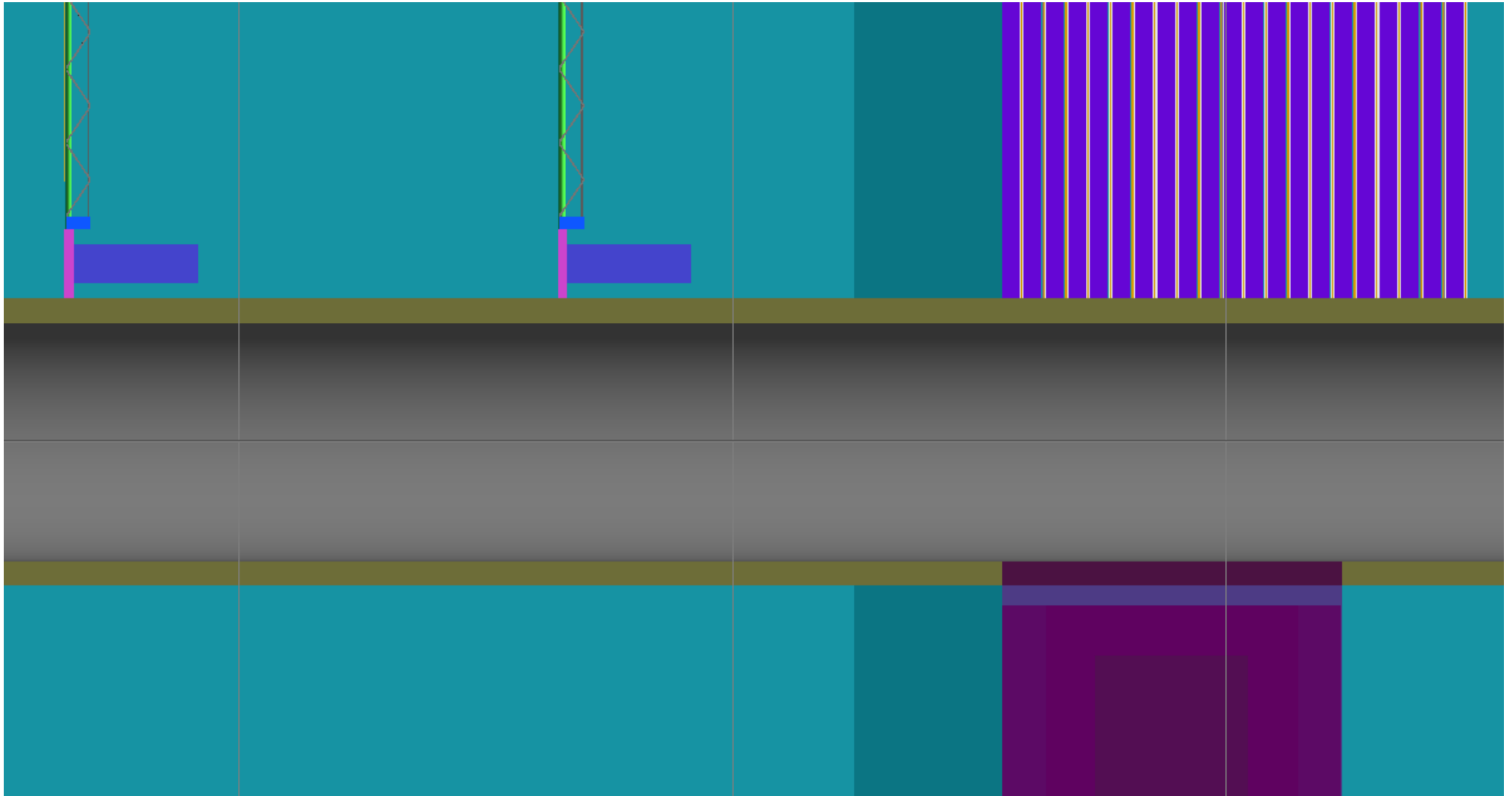
Zoom vtx (z,x)


ecal_track_vtxz_vtxx_front_0
vtx x (mm)
40
20
0
−20
−40
−60
−80
3800
3820
3840
3860
3880
3900
vtx z (mm)
10^5
10^4
10^3
10^2
10
1

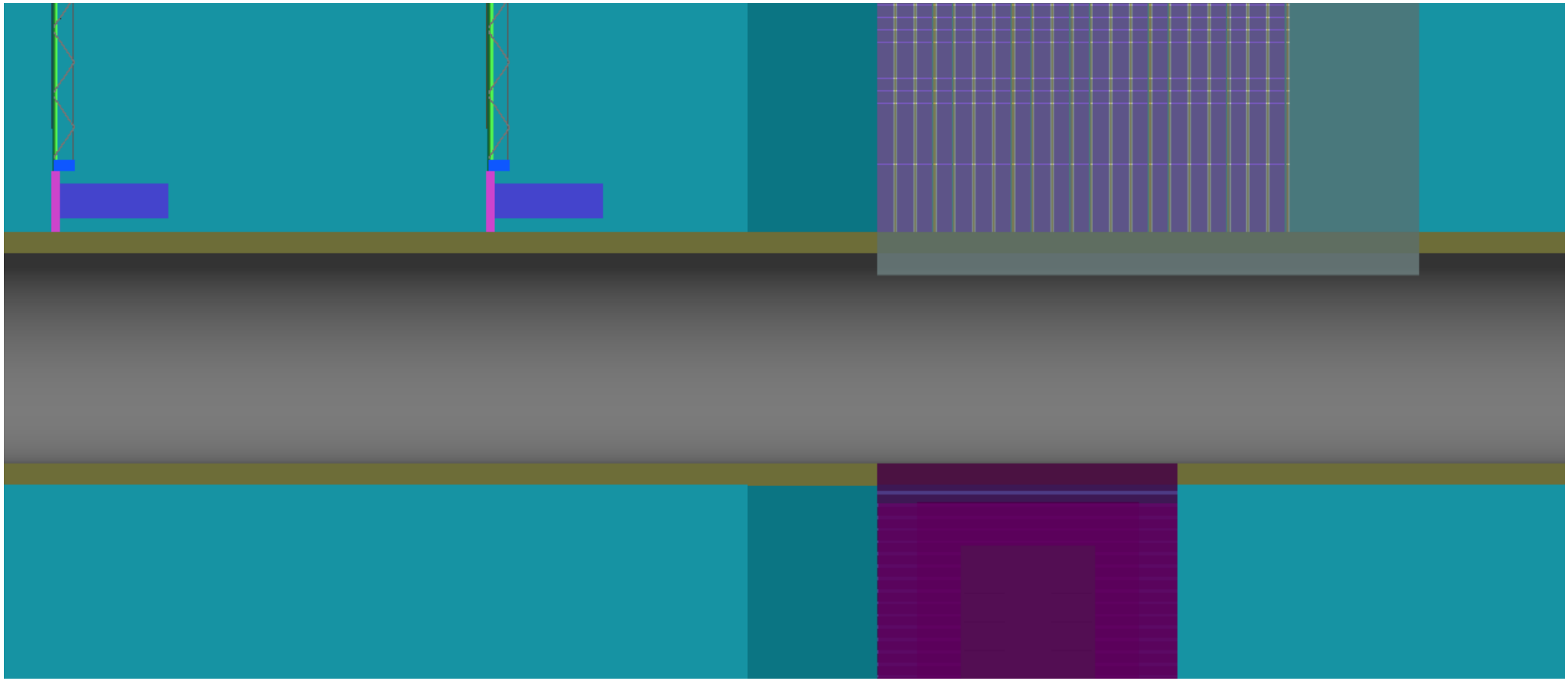
Zoom


ecal_track_vtxz_vtxx_front_0
vtx x (mm)
100
90
80
70
60
50
40
30
20
10
3800
3900
4000
4100
4200
4300
vtx z (mm)
10^3
10^2
10
1

Geometry



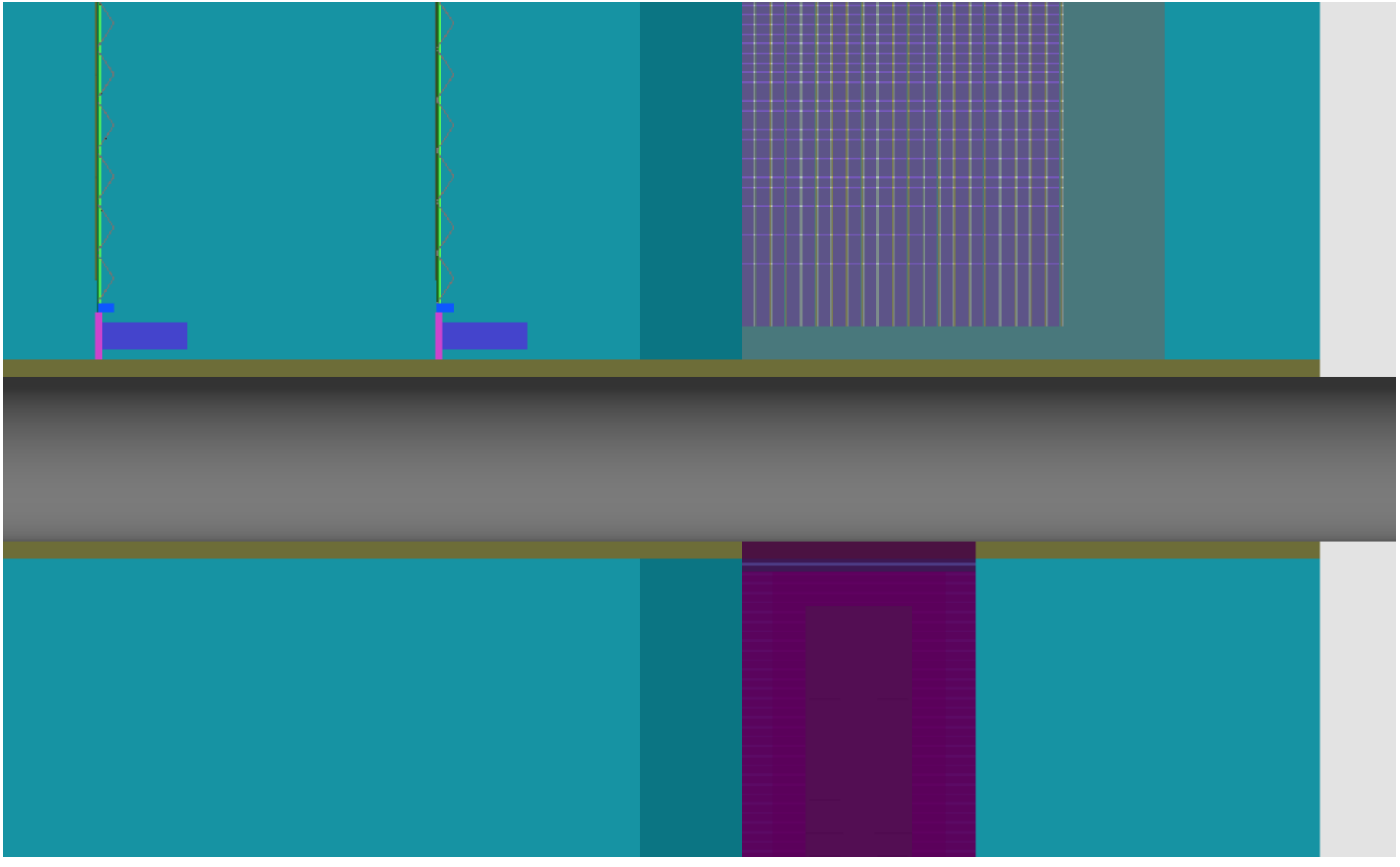
Ecal casing, overlap with the beam pipe



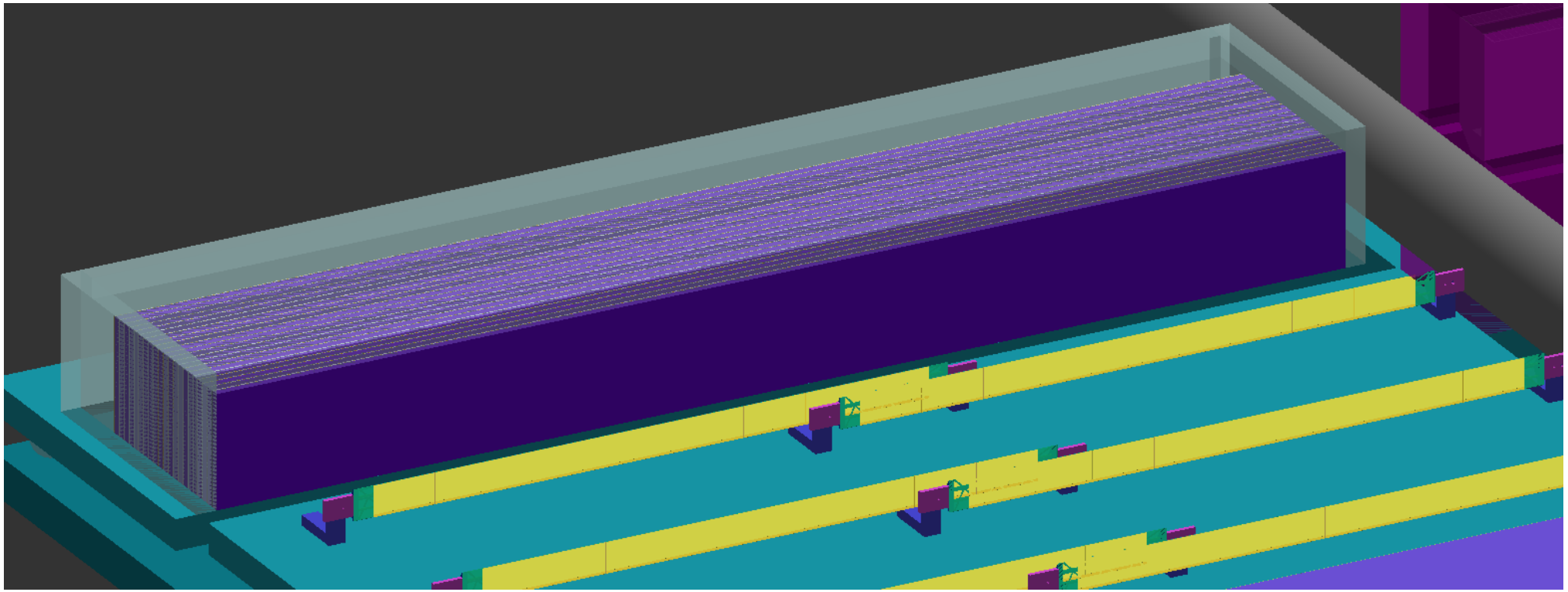
ECal moved +1 cm away from the beam

- Beam pipe R = 24.13 mm;
- Gap: 5 mm;
- Stainless steel panel: 10 mm.

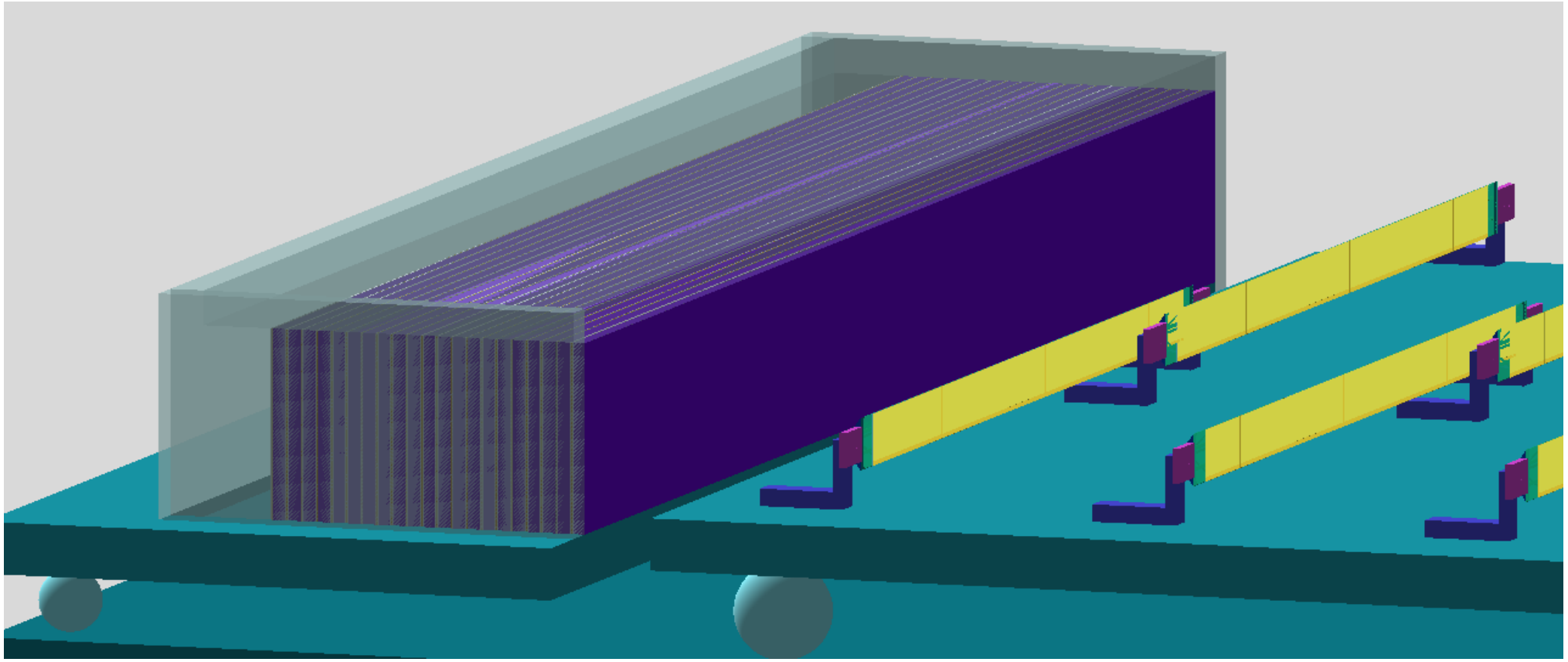
} 39.13 mm



Ecal casing

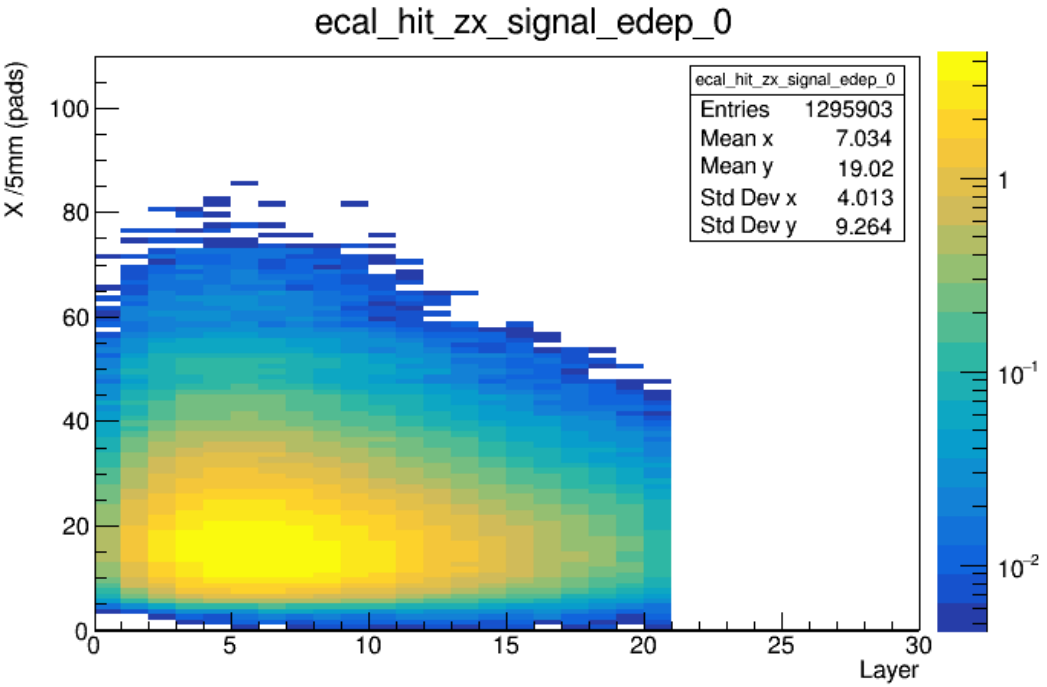


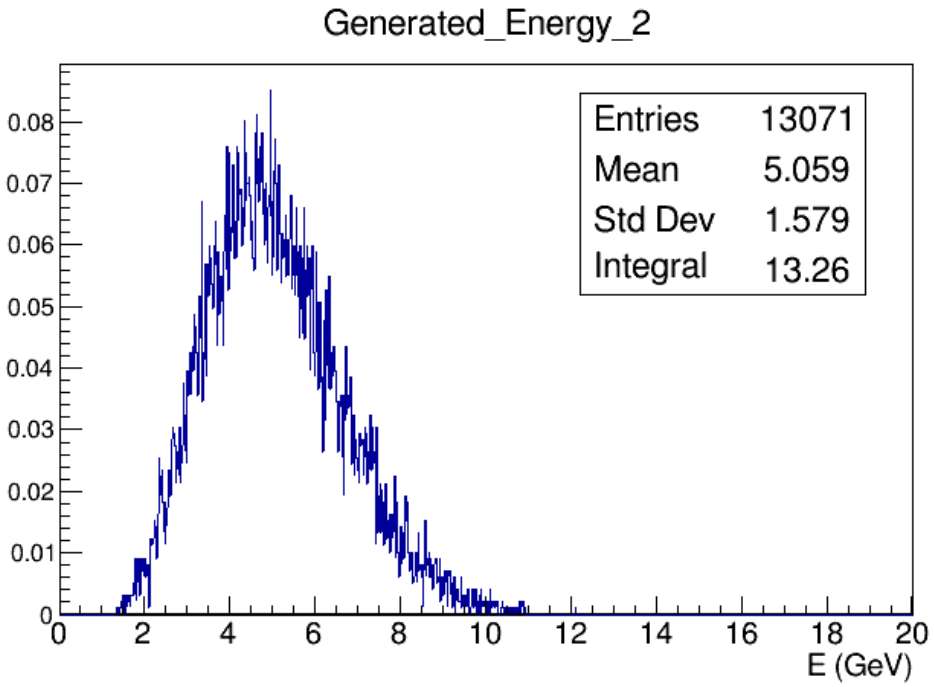
Ecal casing

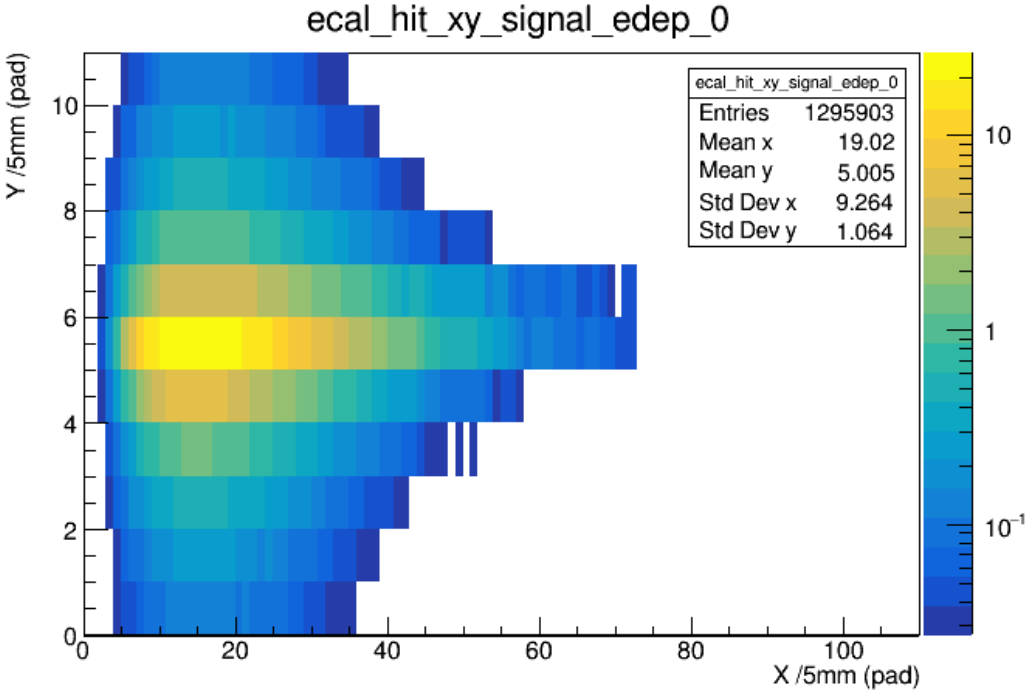


Positron signal in ECal

MC w0_5000nm
986 (947) BX

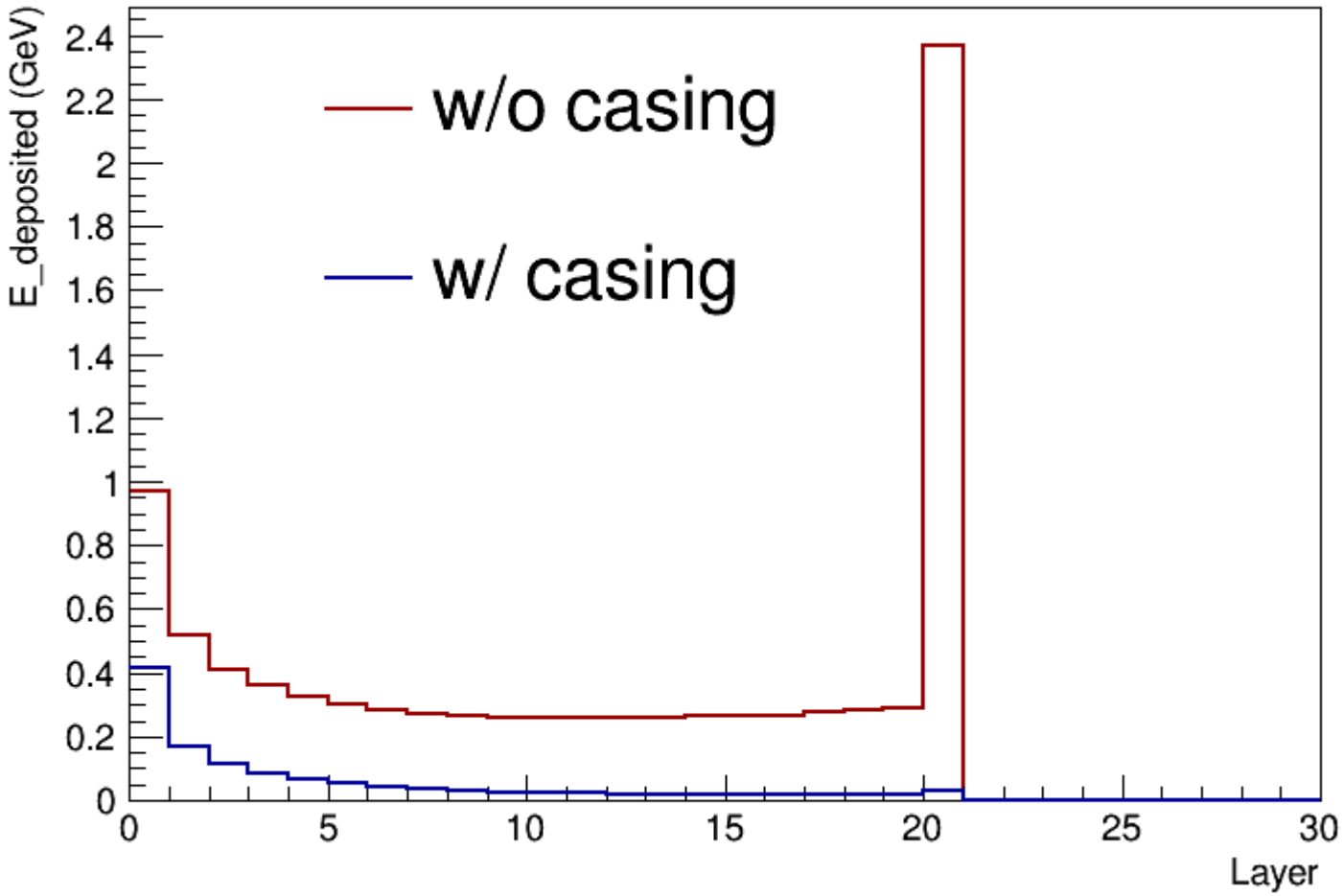






Background in fast simulation

Energy deposited in ECal layers normalized to 1 BX



Hits tree

```
analysisManager->CreateNtuple("Hits", "Hits in sensitive detectors");
analysisManager->CreateNtupleIColumn(2, "eventid");
analysisManager->CreateNtupleIColumn(2, "detid");
analysisManager->CreateNtupleIColumn(2, "layerid");
analysisManager->CreateNtupleIColumn(2, "cellx");
analysisManager->CreateNtupleIColumn(2, "celly");
analysisManager->CreateNtupleDColumn(2, "edep");
analysisManager->CreateNtupleIColumn(2, "hitid");
analysisManager->CreateNtupleIColumn(2, "track_list", fvHitTrackList);
analysisManager->CreateNtupleDColumn(2, "trackx", ftrackx);
analysisManager->CreateNtupleDColumn(2, "tracky", ftracky);
analysisManager->CreateNtupleDColumn(2, "trackz", ftrackz);
analysisManager->CreateNtupleDColumn(2, "trackt", ftrackt);
analysisManager->CreateNtupleDColumn(2, "trackedep", ftrackedep);
analysisManager->CreateNtupleDColumn(2, "weight");
analysisManager->FinishNtuple(2);
```

```
root [1] Hits->Scan("eventid:detid:layerid:cellx:celly:hitid:edep:track_list:trackx:tracky:trackz:trackt:trackedep")
```

Row	Instance	eventid	detid	layerid	cellx	celly	hitid	edep	track_lis	trackx	tracky	trackz	trackt	trackedep
0	0	0	2000	7	52	1	3	0.0001740	426	300.59587	-18.69463	4289.895	0.3594848	0.0001406
0	1	0	2000	7	52	1	3	0.0001740	449	300.65427	-18.80662	4290.2100	0.3611112	1.371e-06
0	2	0	2000	7	52	1	3	0.0001740	448	300.64337	-18.80178	4290.1650	0.3608758	3.172e-06
0	3	0	2000	7	52	1	3	0.0001740	447	300.64062	-18.80665	4290.1568	0.3608271	4.824e-06
0	4	0	2000	7	52	1	3	0.0001740	446	300.63965	-18.80925	4290.1521	0.3607975	1.271e-06
0	5	0	2000	7	52	1	3	0.0001740	445	300.62149	-18.79473	4290.1266	0.3606443	2.042e-06
0	6	0	2000	7	52	1	3	0.0001740	444	300.60655	-18.75177	4290.0862	0.3603981	9.952e-07
0	7	0	2000	7	52	1	3	0.0001740	443	300.60505	-18.75134	4290.0844	0.3603871	1.330e-06
0	8	0	2000	7	52	1	3	0.0001740	442	300.60007	-18.74932	4290.0797	0.3603536	1.501e-06
0	9	0	2000	7	52	1	3	0.0001740	441	300.59981	-18.74593	4290.0733	0.3603199	1.202e-06
0	10	0	2000	7	52	1	3	0.0001740	440	300.60075	-18.74306	4290.0551	0.3602367	1.037e-06
0	11	0	2000	7	52	1	3	0.0001740	439	300.60181	-18.74155	4290.0509	0.3602157	1.264e-06
0	12	0	2000	7	52	1	3	0.0001740	438	300.60950	-18.73313	4290.0400	0.3601487	6.255e-06
0	13	0	2000	7	52	1	3	0.0001740	437	300.59889	-18.71411	4289.9511	0.3597459	5.969e-06
0	14	0	2000	7	52	1	3	0.0001740	457	300.59889	-18.71411	4289.9511	0.3597465	1.115e-06
1	0	0	2000	6	51	4	9	0.0004916	1495	298.06353	-3.108237	4285.4509	0.2955043	0.0003255