

Background from the Dump

ECAL-P in e-laser setup

shan.huang@desy.de

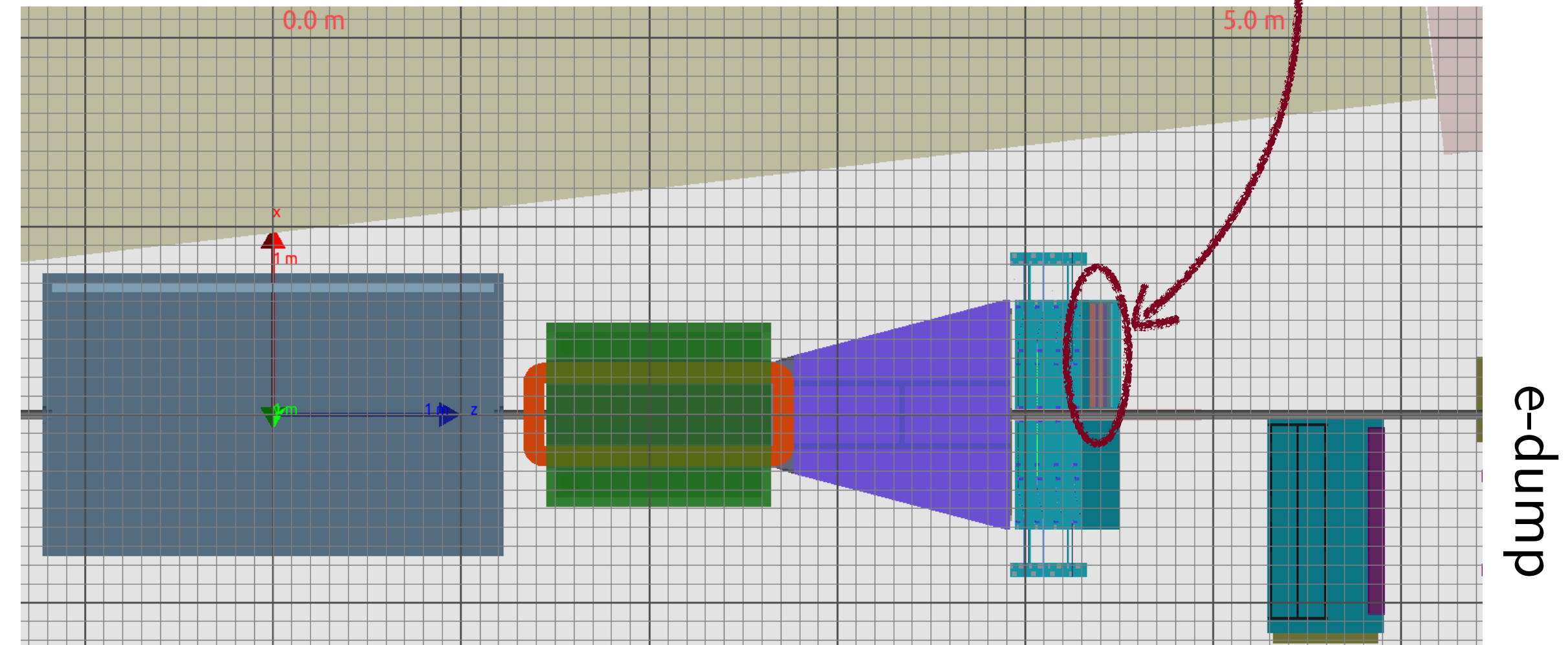
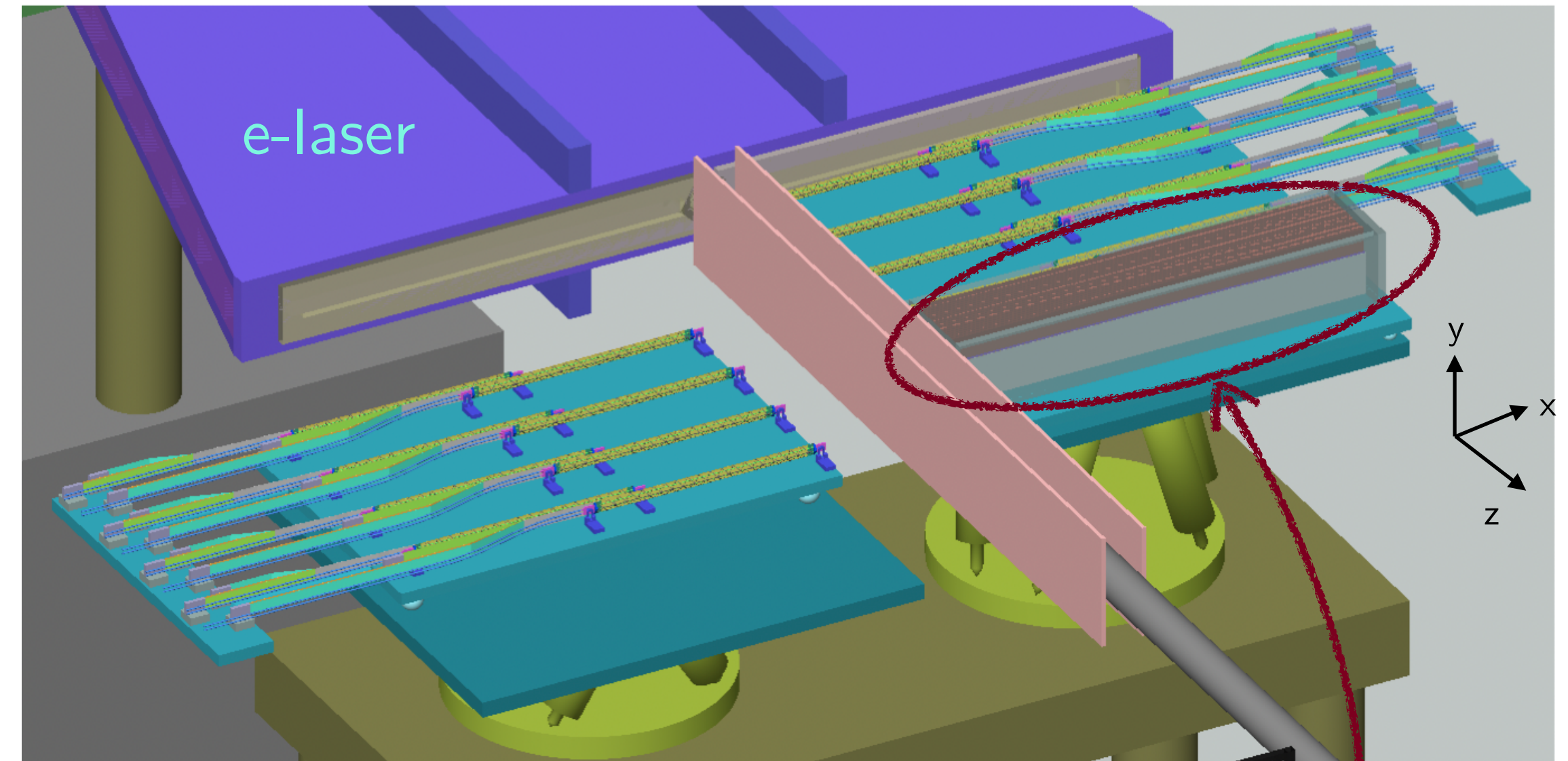
ECAL-P

Electromagnetic calorimeter on the positron arm

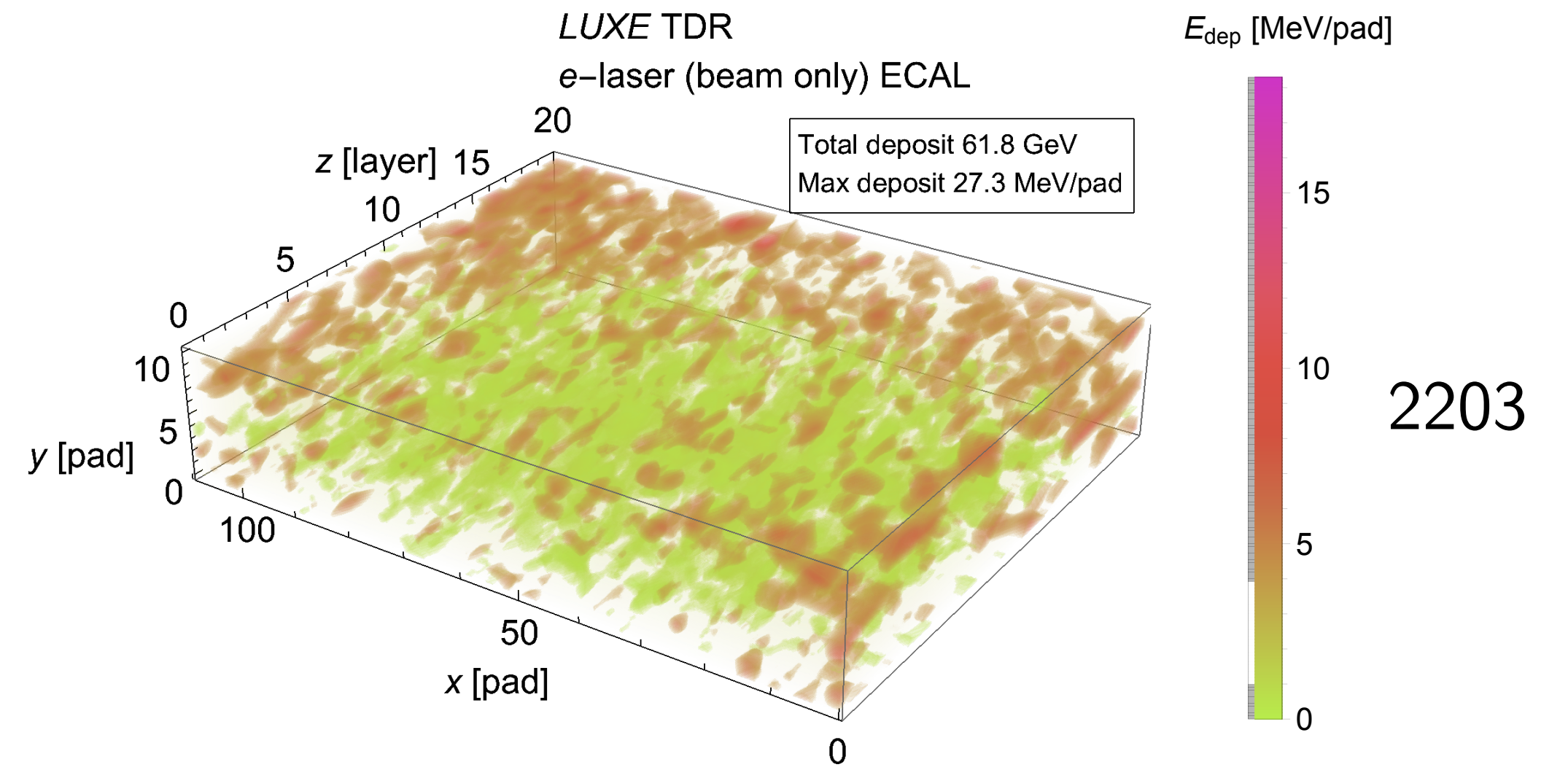
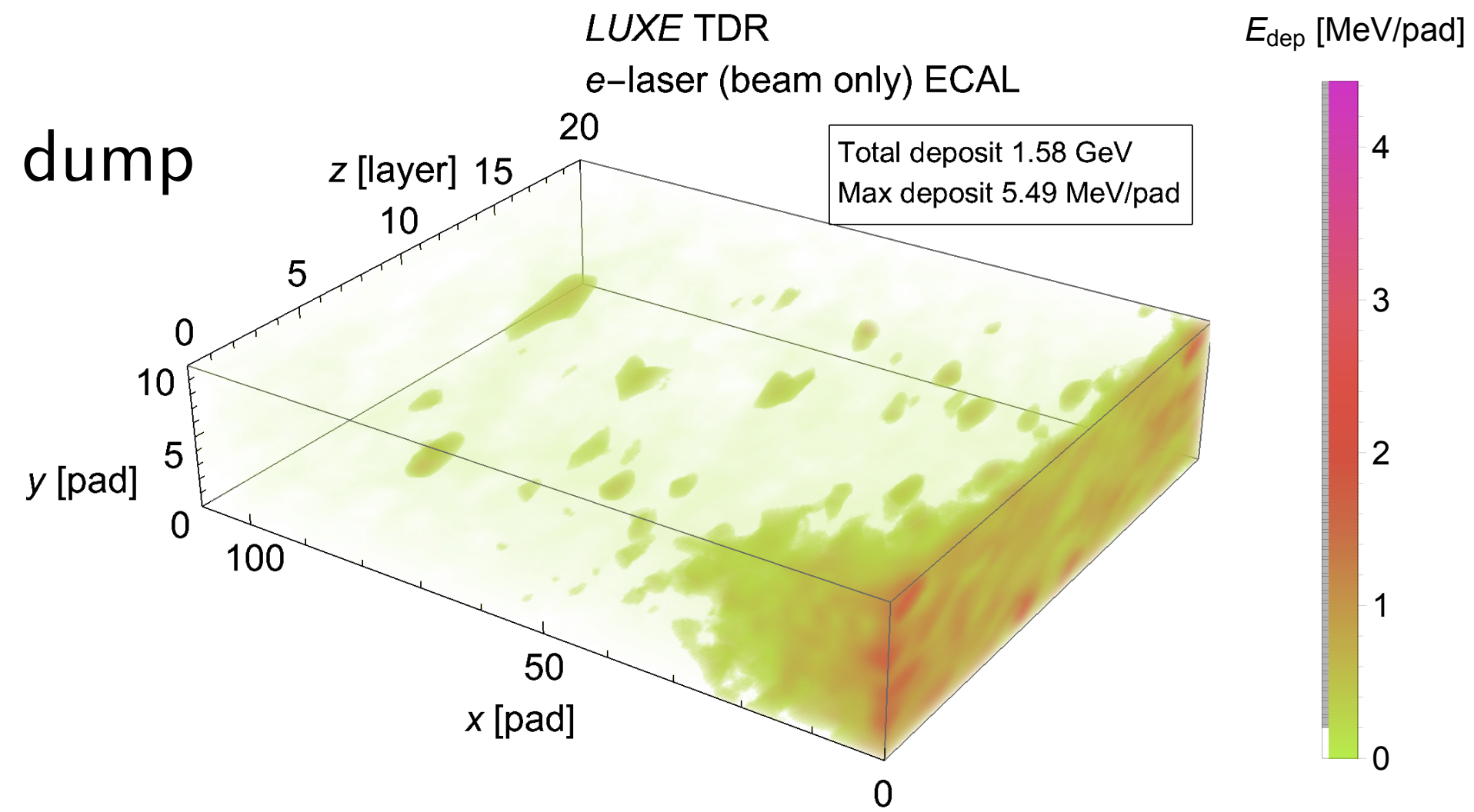
- Near the electron dump
- Acceptable background level in the CDR
- $\text{Signal} = \text{Readout} - \text{Background}$

Shielding from the CDR

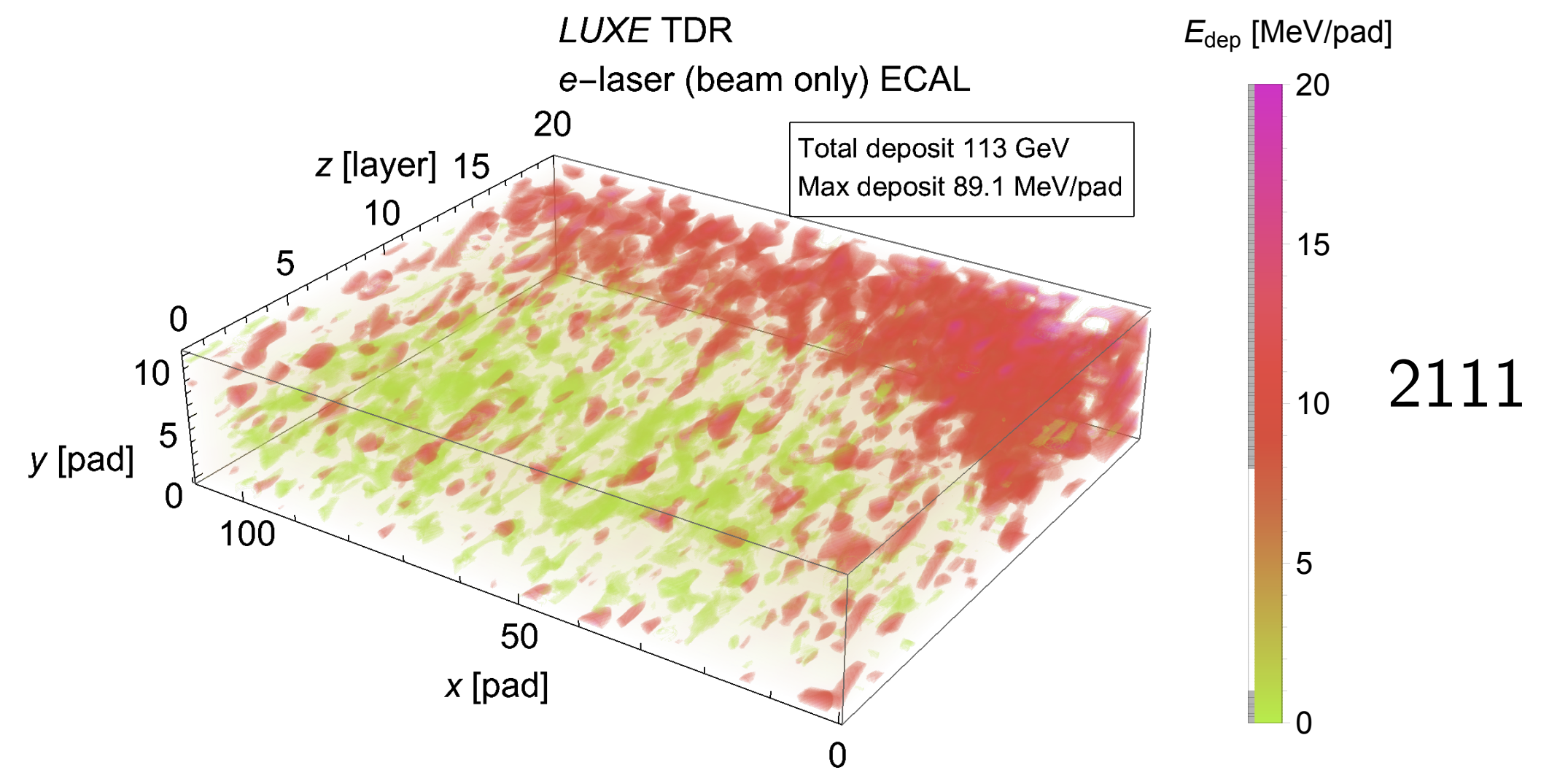
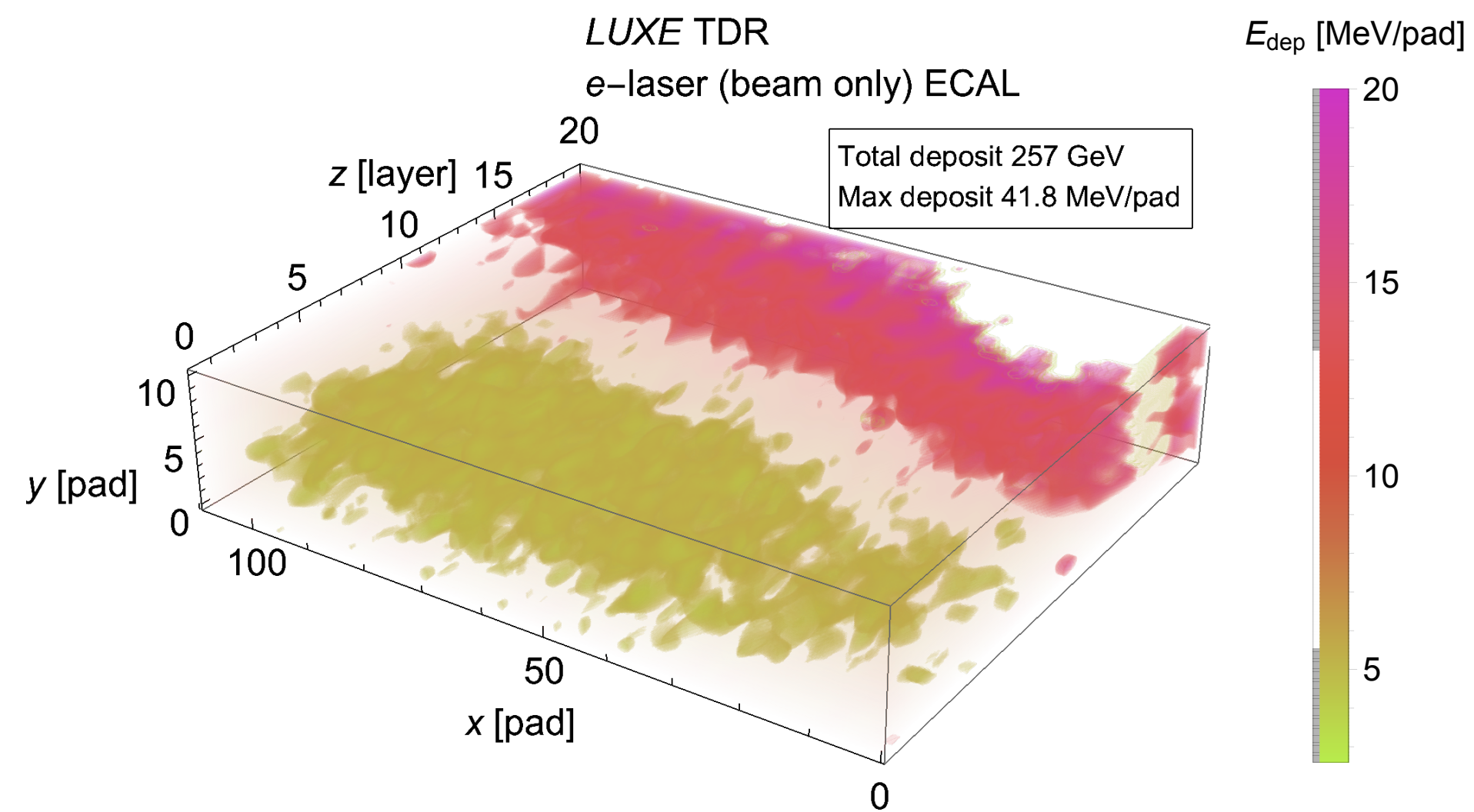
- Vacuum window change
 - extra surrounding lead shielding
- The beam dump (“hadronic background”)
 - 2111: neutron absorber BPH concrete attached to the electron beam dump
 - 2203: changed to iron shielding; implemented additional infrastructure components



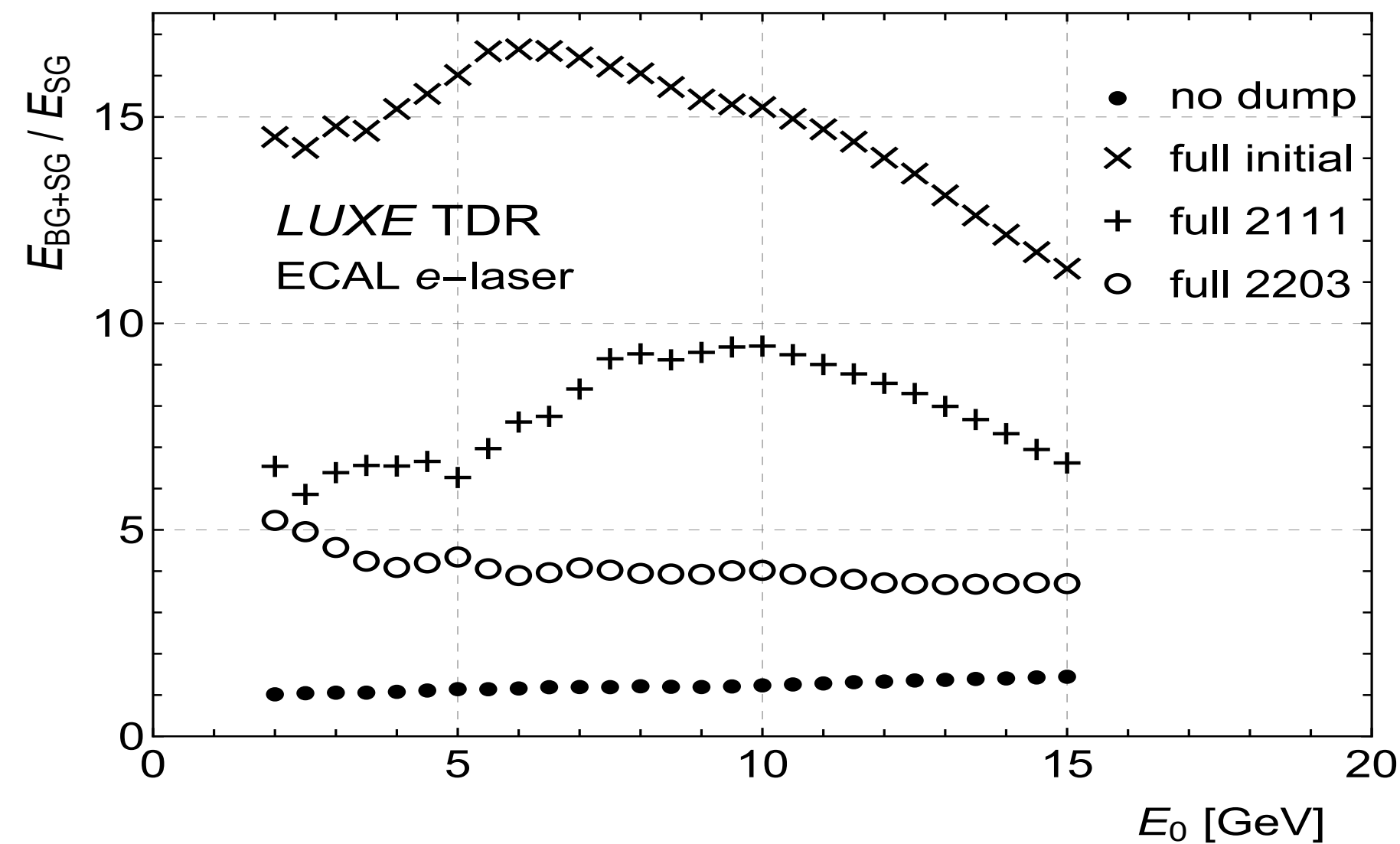
Without dump



Full BG
beamdump

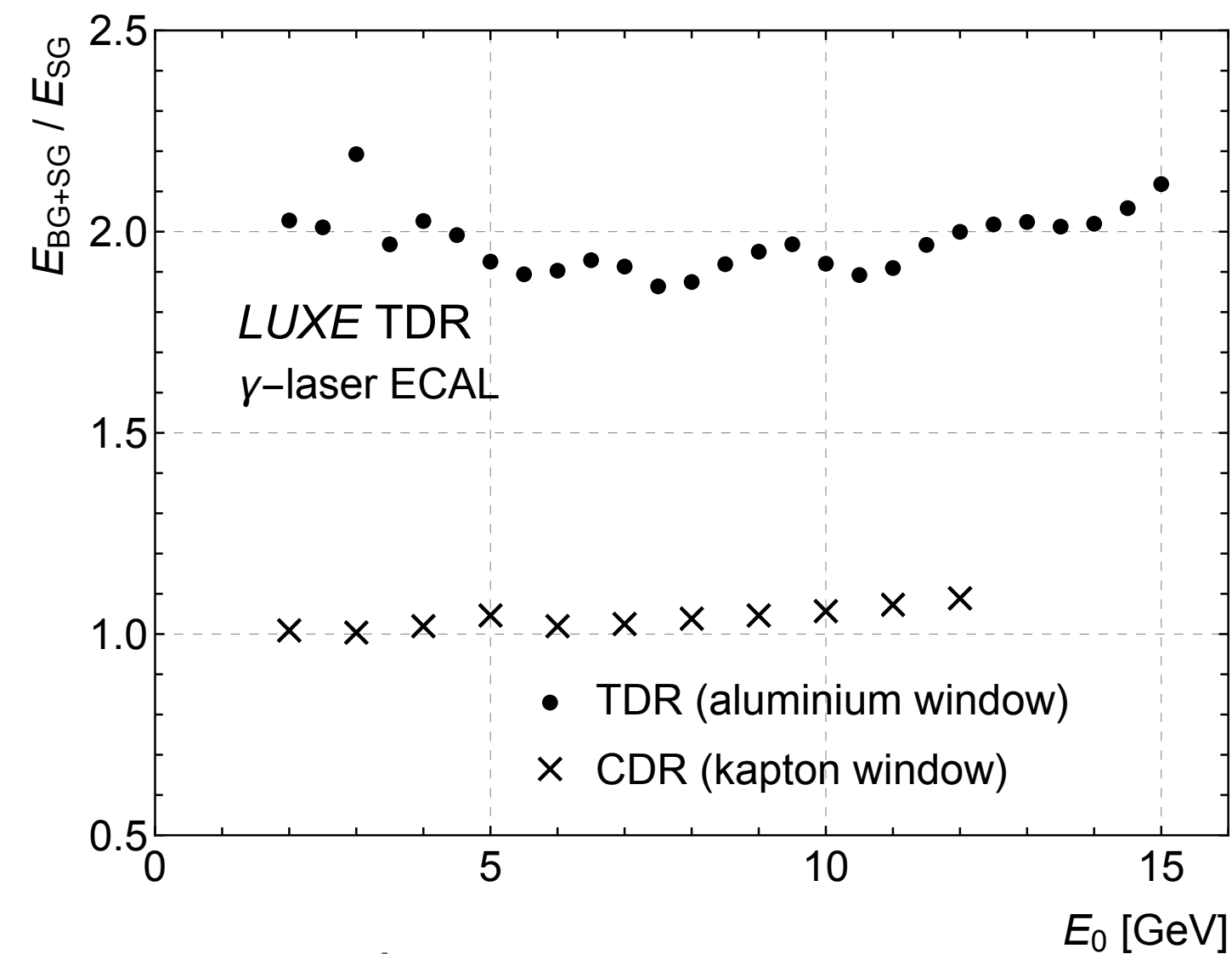
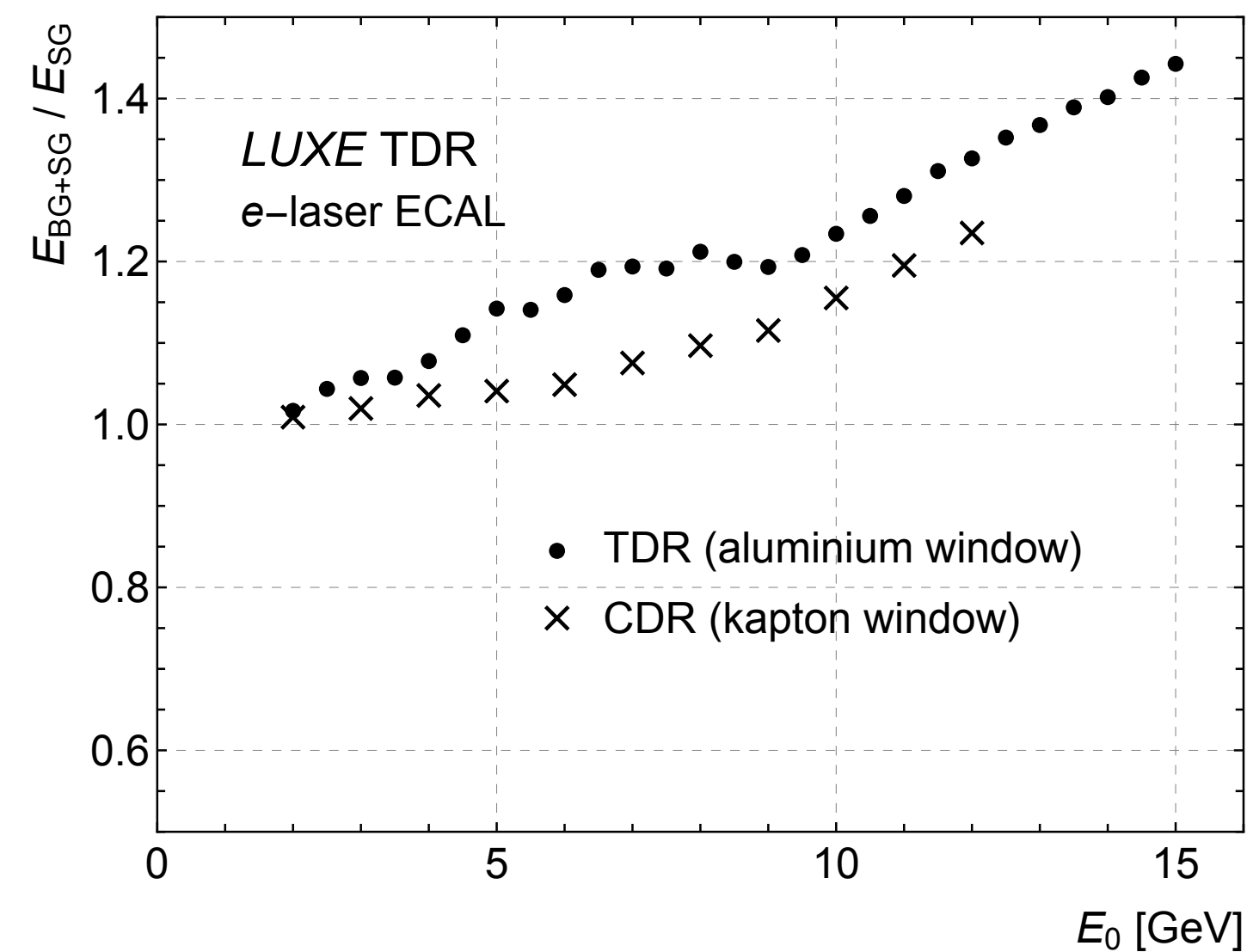


Effect on Signal



Louis's method:

- Mono-energetic positron mixed with local background
- Comparing the ratio between background on signal and signal only
- Should not exceed 1.5
- Great improvements from initial full simulation



Particles entering ECAL in Background runs

		w/o dump	full	shield 2111	shield 2203
electron	number	6,490.00	177,547.37	89,584.53	46,504.43
	energy [GeV]	6.74	253.38	133.96	53.53
	part. energy [MeV]	1.039	1.427	1.495	1.151
positron	number	363.94	20,629.92	10,802.29	4,709.06
	energy [GeV]	4.09	54.42	36.69	10.24
	part. energy [MeV]	11.228	2.638	3.396	2.174
photon	number	73,541.55	6,264,212.95	3,041,117.48	1,402,269.09
	energy [GeV]	136.60	11,631.95	5,897.42	2,444.52
	part. energy [MeV]	1.857	1.857	1.939	1.743
neutron	number	1,315.08	3,208,244.84	670,386.82	1,039,653.90
	energy [GeV]	27.31	1,118.79	548.87	177.19
	part. energy [MeV]	20.766	0.349	0.819	0.170

Source: Tracks tree of BG .root files

Particle energy cut at 1 keV