

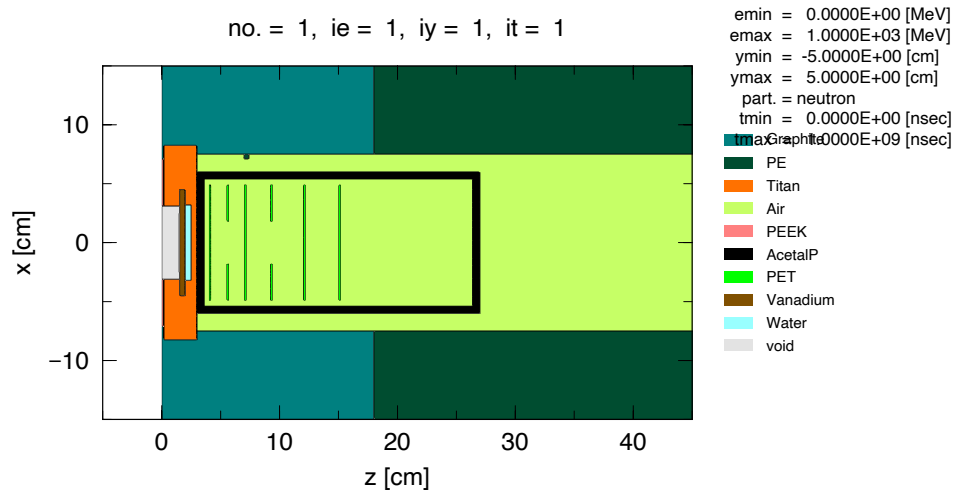
Weekly report

- ◆ EIC ZDC simulation
 - LYSO vs PbWO_4
 - https://indico2.riken.jp/event/4163/contributions/19025/attachments/11311/16172/0701EICJ_crystal_shimizu.pdf
 - Resolution is worse for PbWO_4 but is acceptable wrt the requirement of 20%.
 - Efficiency looks fine.
 - Next: Use Photoproduction MC for ZDC study.

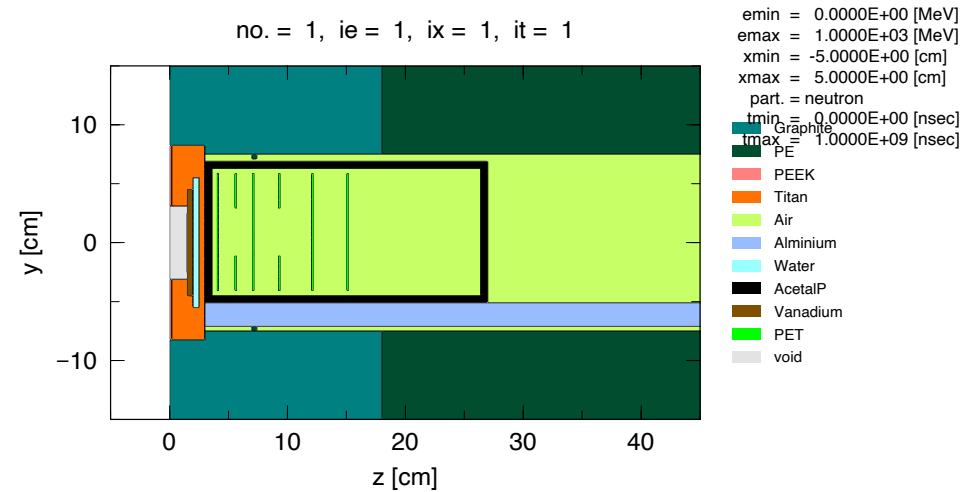
- ◆ PHITS simulation for the RANS test in March
 - Calculate the amount of neutrons.
 - Geometry is ready
 - Source is ready
 - Output is in question...

PHITS: Geometry setup

x-z view (looked from top)



y-z view (looking from side)



- ◆ Consulted Wakabayashi-san@RANS for the geometry.
 - Still might have further modification around neutron exit.
- ◆ Somehow 3D viewer is not working. Issue in OpenGL??

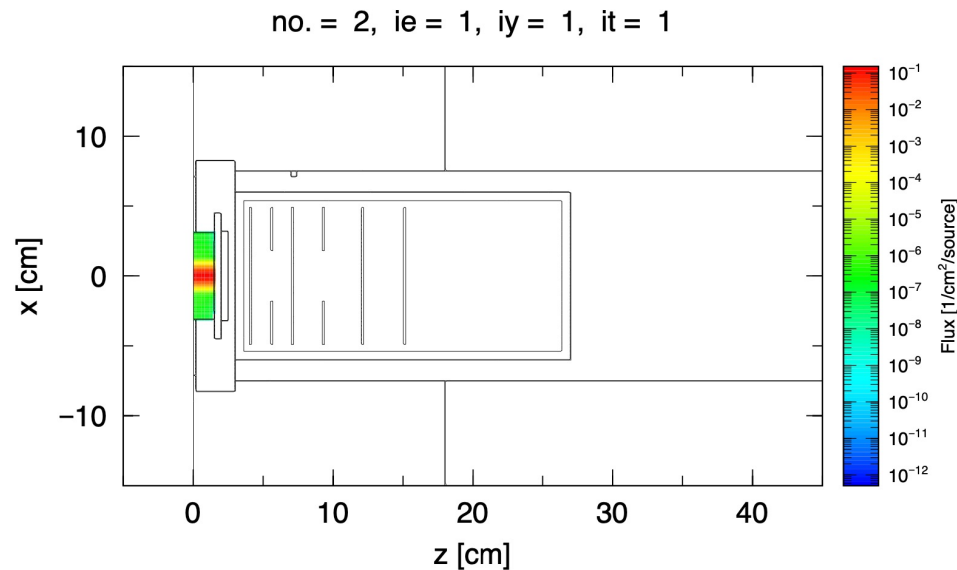
PHITS simulation

- ◆ 2×10^8 protons are simulated

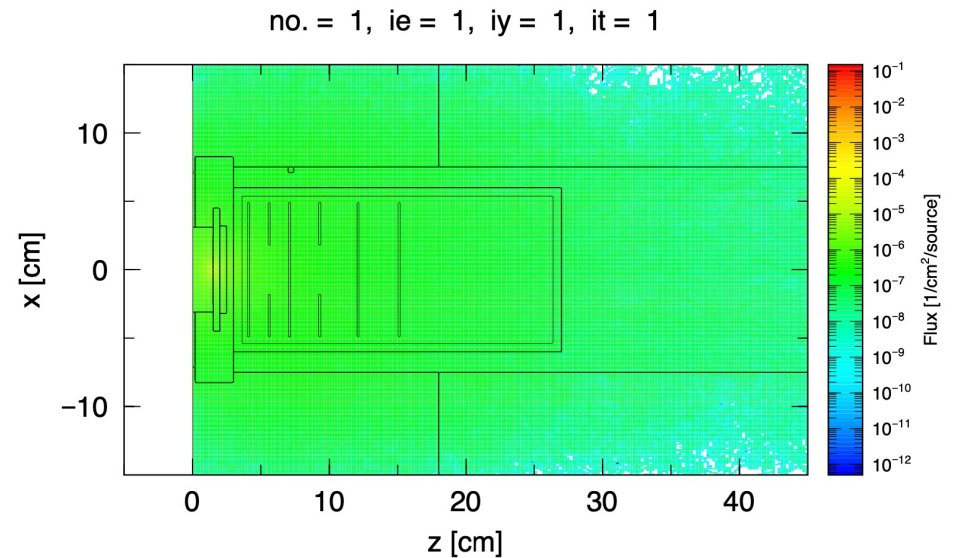
Beam setup: xy-gaussian with FWHM=0.6 cm, 7 MeV

← @RANS: collimated to 2cm circle, gaussian

Slice of $-5 \text{ cm} < y < 5 \text{ cm}$
proton



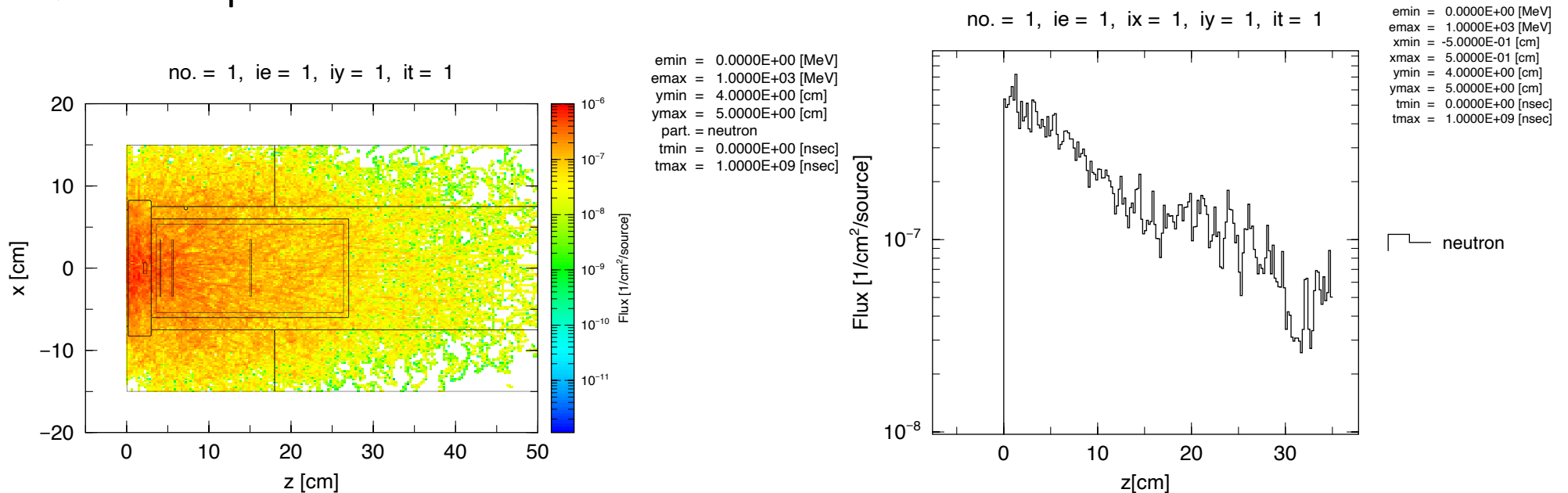
neutron



One can clearly see that the proton beam makes neutrons.

PHITS: Fluence @ y=4cm

- ◆ 2×10^8 protons are simulated.



Our RANS test in March

run1: 1092 sec, averaged current = 33 microA

proton charge: $1.6 \times 10^{-19} \rightarrow \sim 2 \times 10^{14}$ protons per second

Measurement using Indium foil (1cm²) $\rightarrow \sim <10^{12}$ at the upstream foils

Simulation gives 3×10^{-7} /cm²/source at z ~ 5 cm (c.f. first PCB layer = 4cm)

$\rightarrow 3 \times 10^{-7} \times (2 \times 10^{14}) \times 1000$ [s] = 6×10^{10} /cm² ?? misunderstanding???

To do: Understand the output and define the measurement points