Update on Energy Deposition for the 4-horn system, 4 MW

## (v/anti-v beam, pi+/pi- focusing)

Nikos for IPHC EURONU group

update

- Fix: raddecay-card and energy deposition scoring-conflict corrected, *thanks* A. Ferrari

- anti-v beam included: more power around/forward of target/horn gallery due to pi+ de-focusing

- iron piece at the entrance of beam-dump removed

- tritium and sodium-22 <u>activity</u> in molasse <u>under CERN-limits</u> for the approximated geometry
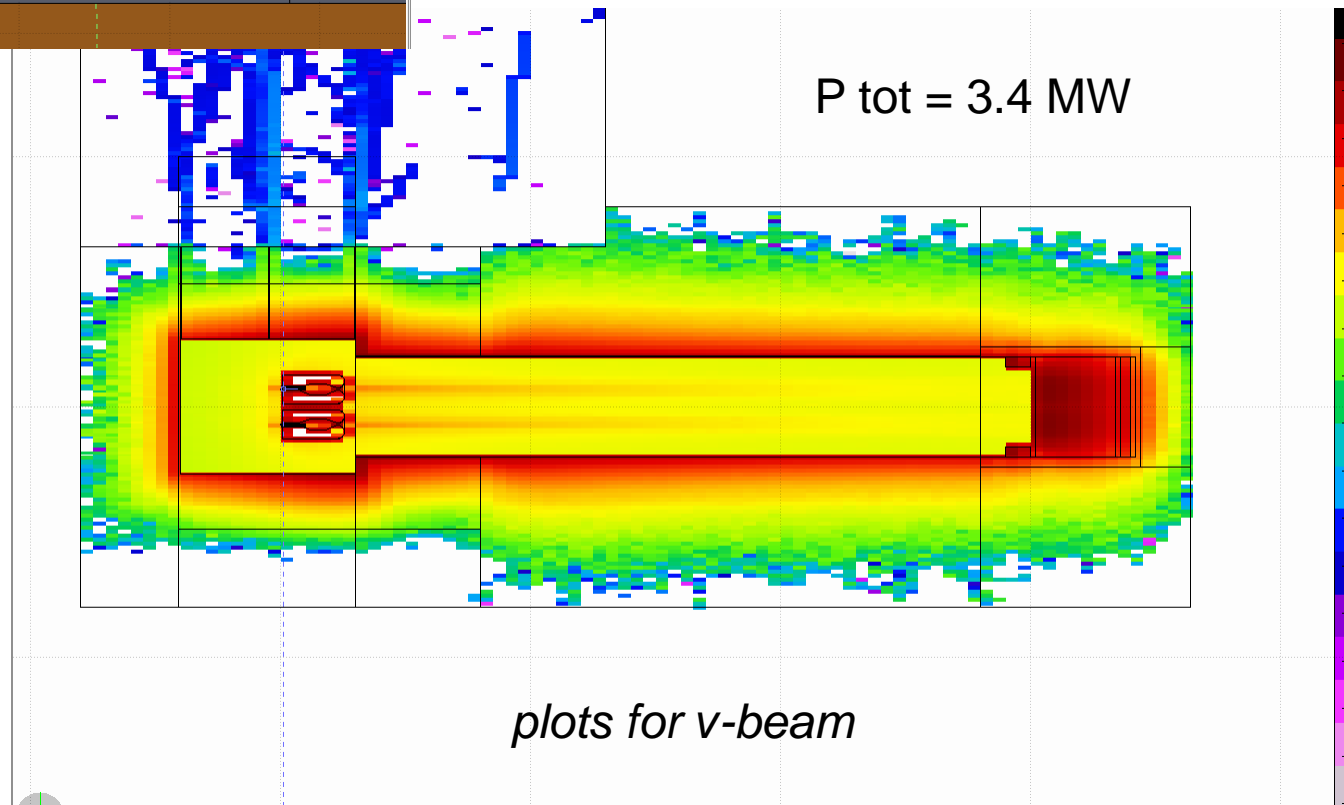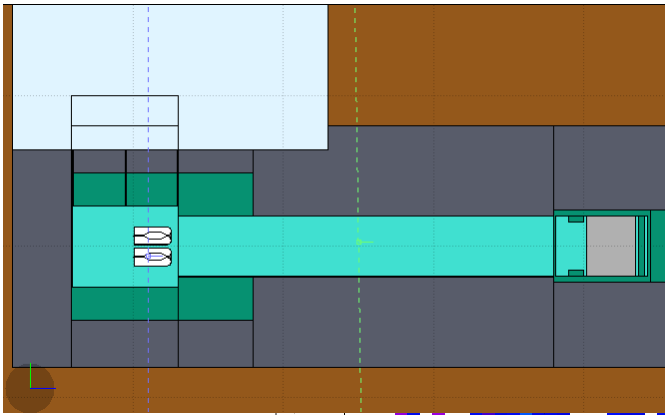
simulation layout - fluka, flair gui/analysis
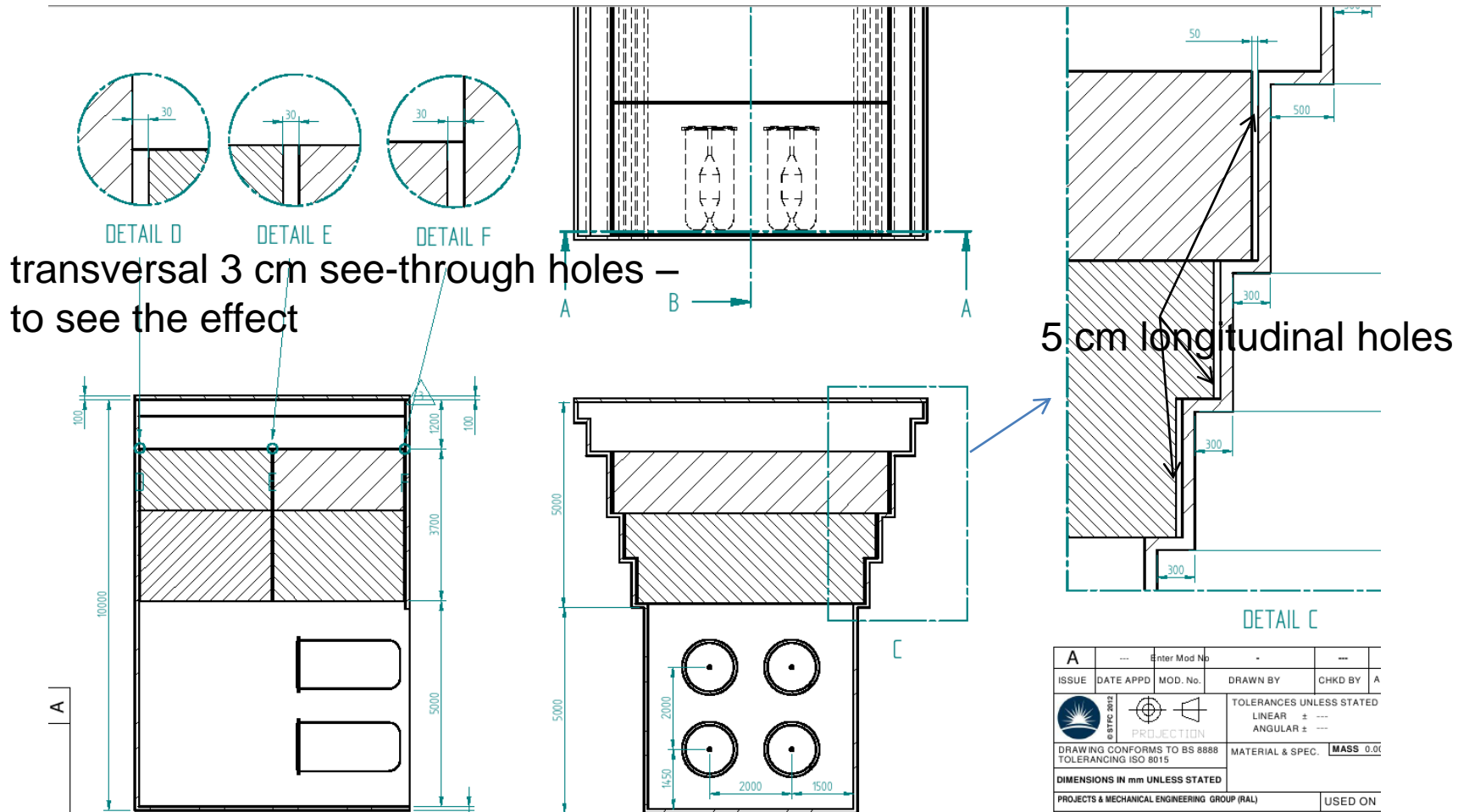## iron, concrete, molasse, He
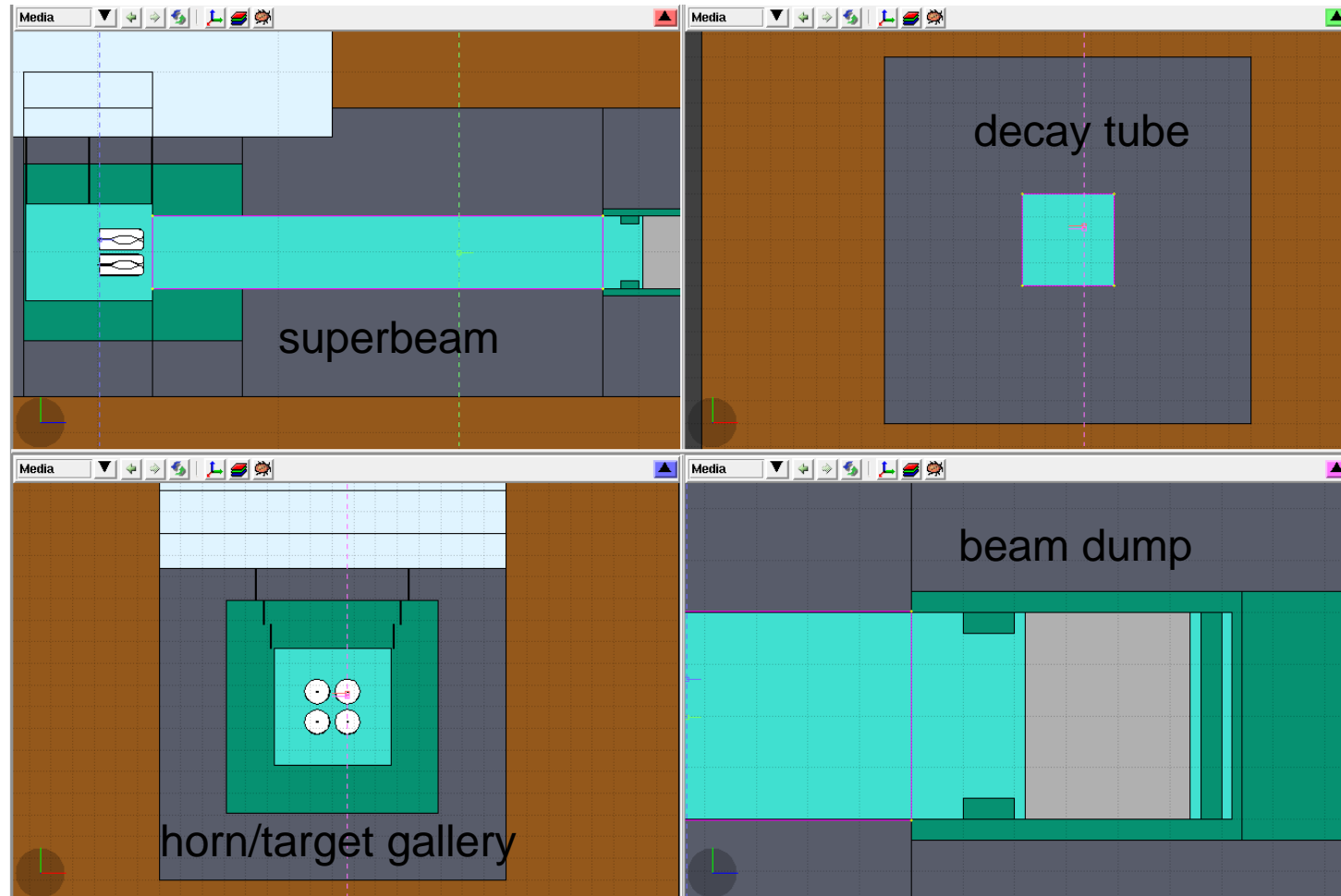
total power
iron, concrete, molasse, He

P tot = 3.4 MW

plots for v-beam

horn/target gallery

Dan's geometry for horn/target gallery – including holes:

transversal 3 cm see-through holes –
to see the effect

5 cm longitudinal holes

horn/target gallery
iron, concrete, molasse, He

L = 7.1 m
H, W = 5.4 m
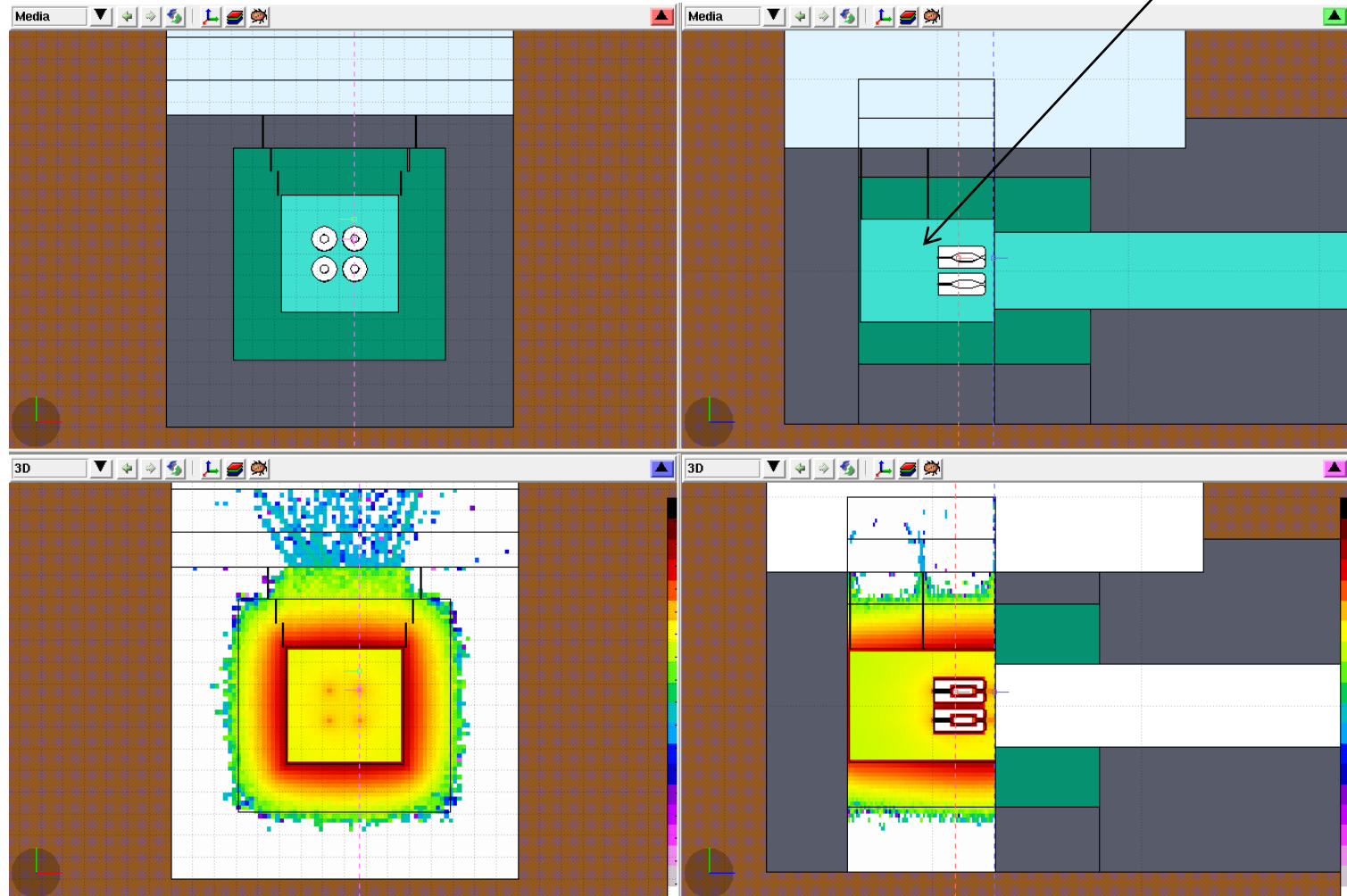
horn/target gallery: horn, iron, concrete

horn area length = 7.1 m	horn conductors	iron t = 2.2 m x = -4.9-> 4.9 m	concrete t (above horns) = 1.5 m t (surroundings) = 3.1 m x = -8 -> 8 m
ν beam	32 kW	437 kW	0.01 kW
anti-ν beam	32 kW	496 kW	0.01 kW

➢ more power around 4-horn system for the anti-ν beam due to pi+ defocusing

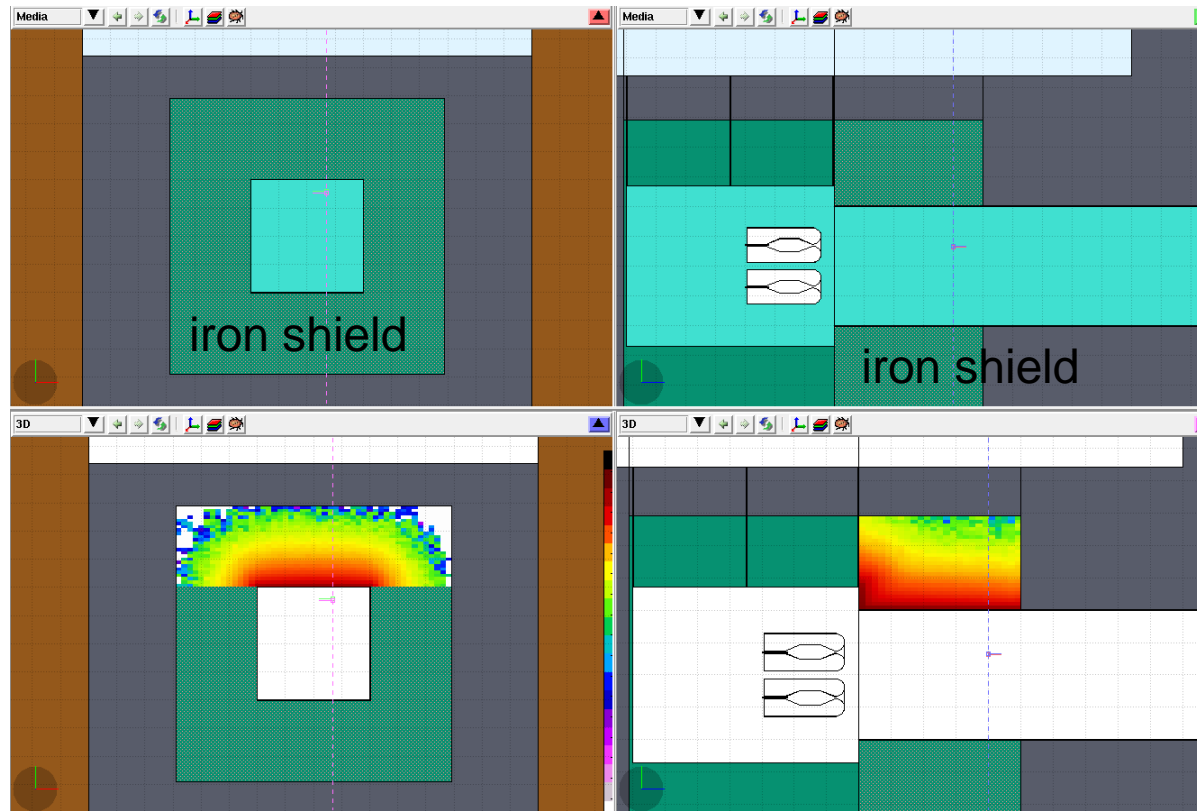# decay tunnel and surrounding area
iron, concrete, molasse, He

L = 25 m, W, H = 4 m

concrete

shield

He
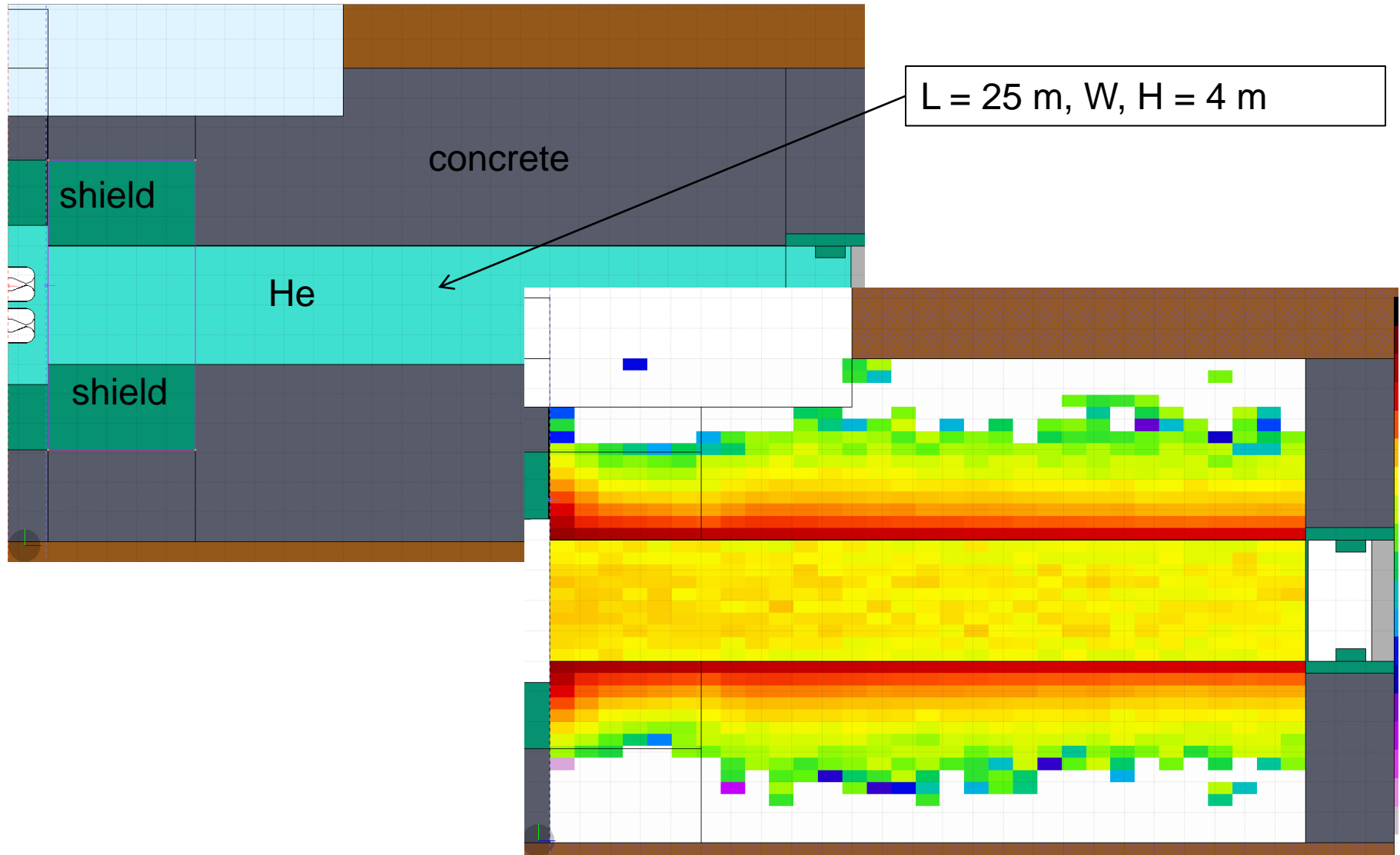
shield

decay tunnel iron vessel + concrete

iron, concrete, molasse, He

concrete
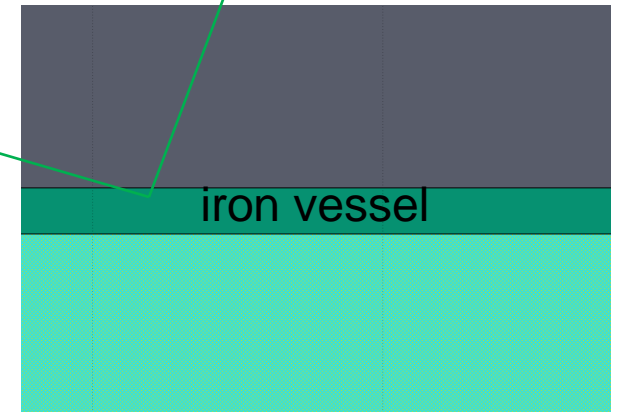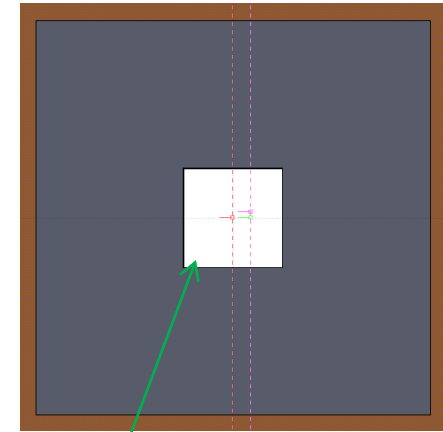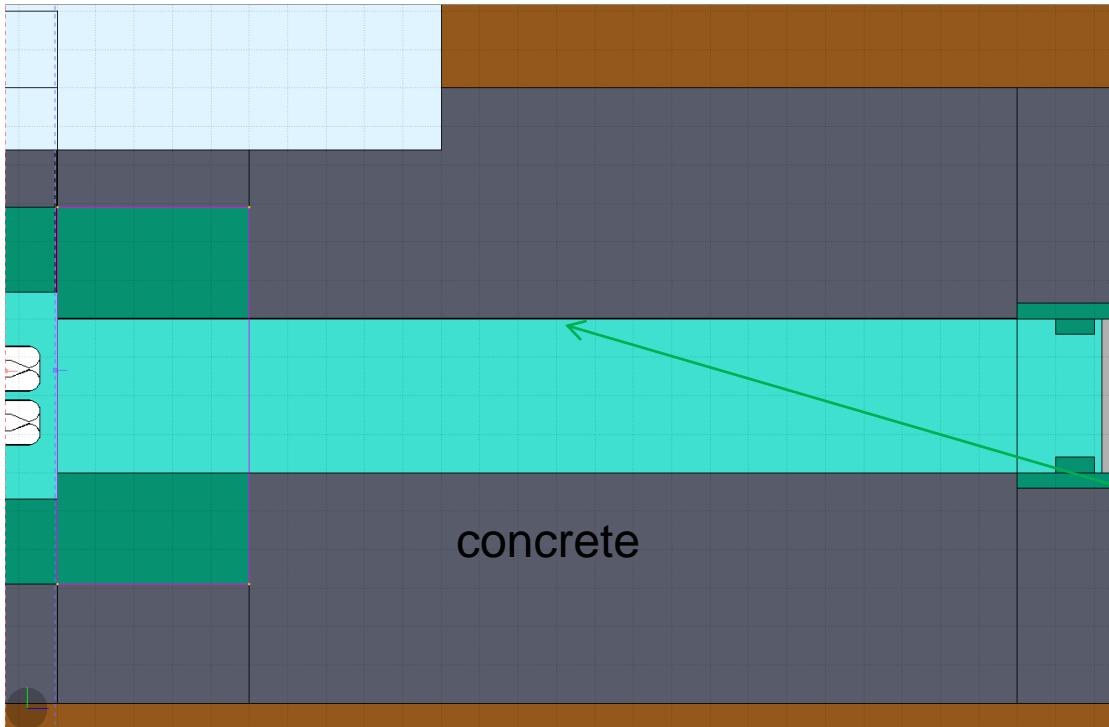
iron vessel

area L= 25 m	dt iron vessel H, W = 4 m t = 1.6 cm a la T2K	dt surounding concrete t = 6 m
ν beam	390 kW	485 kW
anti-ν beam	392 kW	588 kW

decay tunnel upstream iron shield

area length = 5 m	dt iron shield t= 2.9 m x = -4.9 -> 4.9 m	dt iron shield-above decay tunnel t = 2.9 m
ν beam	610 kW	159 kW
anti-ν beam	775 kW	201 kW

beam dump

upstream, downstream iron shields

iron vessel + shields

graphite absorber core

outer iron shield
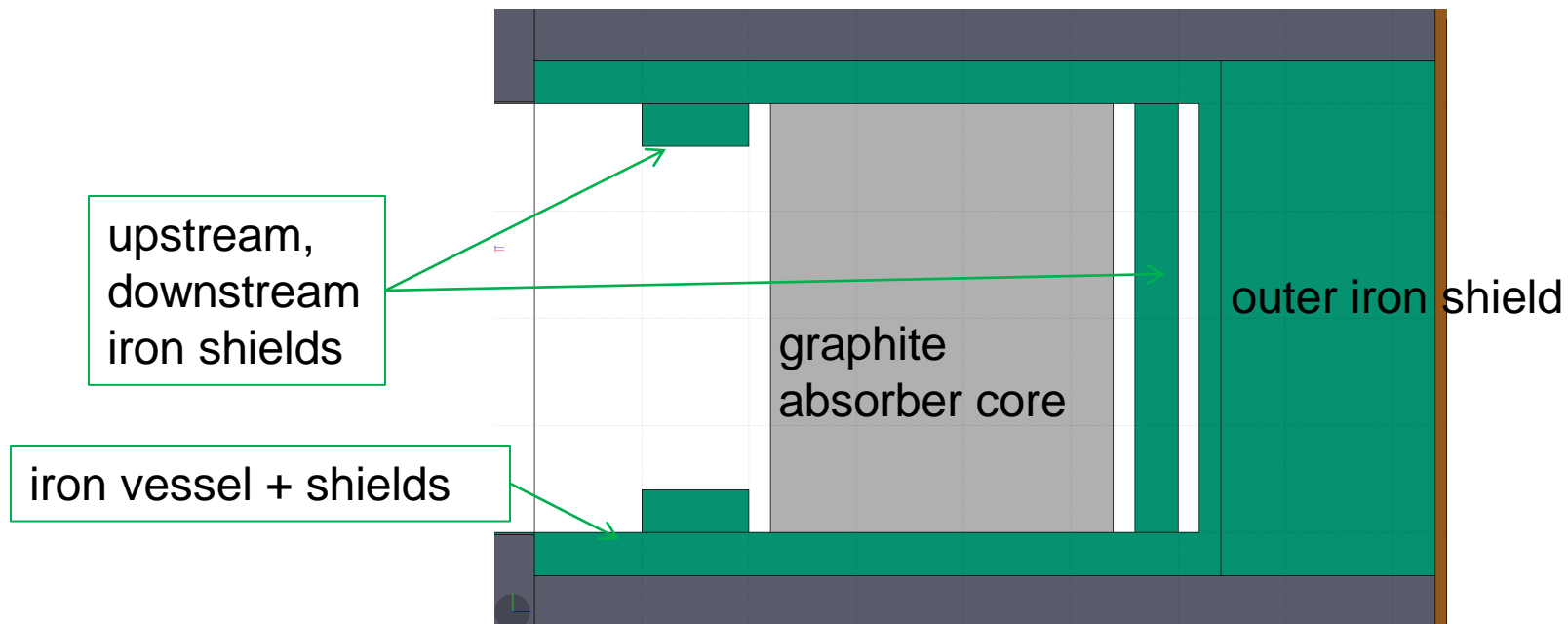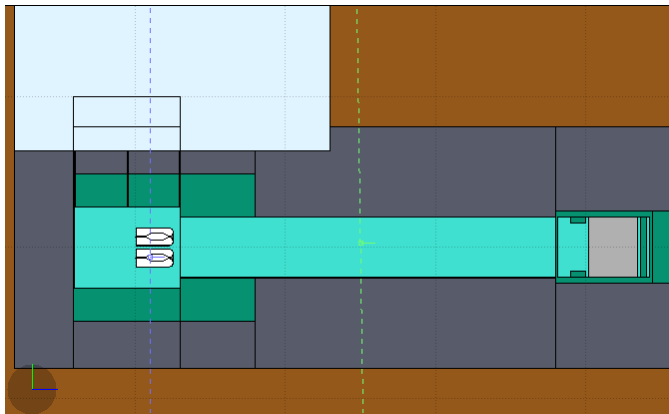
area L = 6.4 m	graphite L = 3.2 m H, W = 4 m	upstream shield	downstream shield	outer shield	surrounding concrete t = 6 m
ν beam	778 kW	146 kW	19 kW	1.6 kW	4 kW
anti-ν beam	485 kW	128 kW	12 kW	1 kW	3.6 kW

ν/anti-ν power distribution
iron, concrete, molasse, He
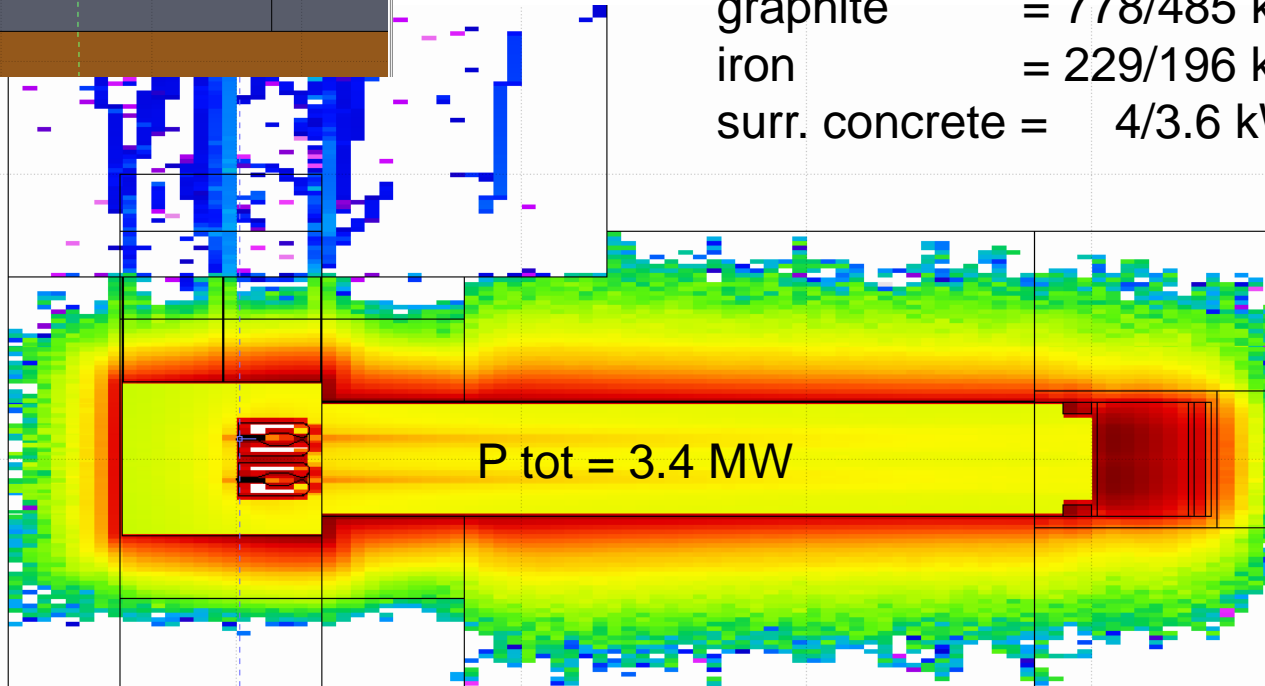

beam dump
graphite   = 778/485 kW
iron   = 229/196 kW
surr. concrete =   4/3.6 kW

P tot = 3.4 MW

horns/target gallery
iron   = 437/496 kW
horn = 32 kW
target =85 kW

decay tunnel
iron vessel   = 390/392 kW
upstream iron = 610/775 kW
surr. concrete = 485/588 kW

thanks