

Assessment of HIE-ISOLDE's expected layout through FLUKA simulations(using Flair).

Overview of some of the work done so far within CATHI's HIE-ISOLDE project using Fluka code and Flair software for dose and energy estimations due to radiation.

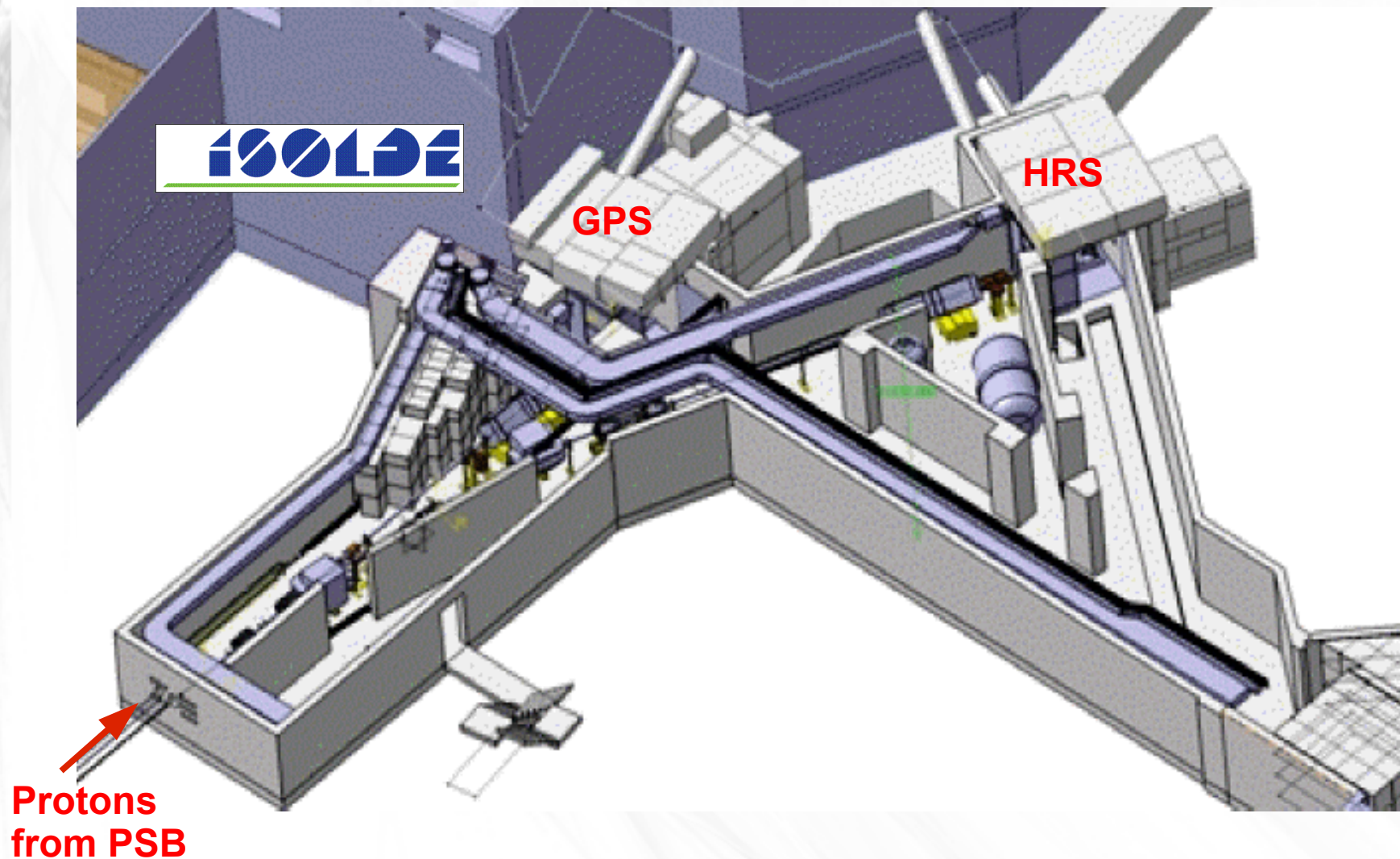
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Supervisor: **PhD. Vasilis Vlachoudis**

Overview

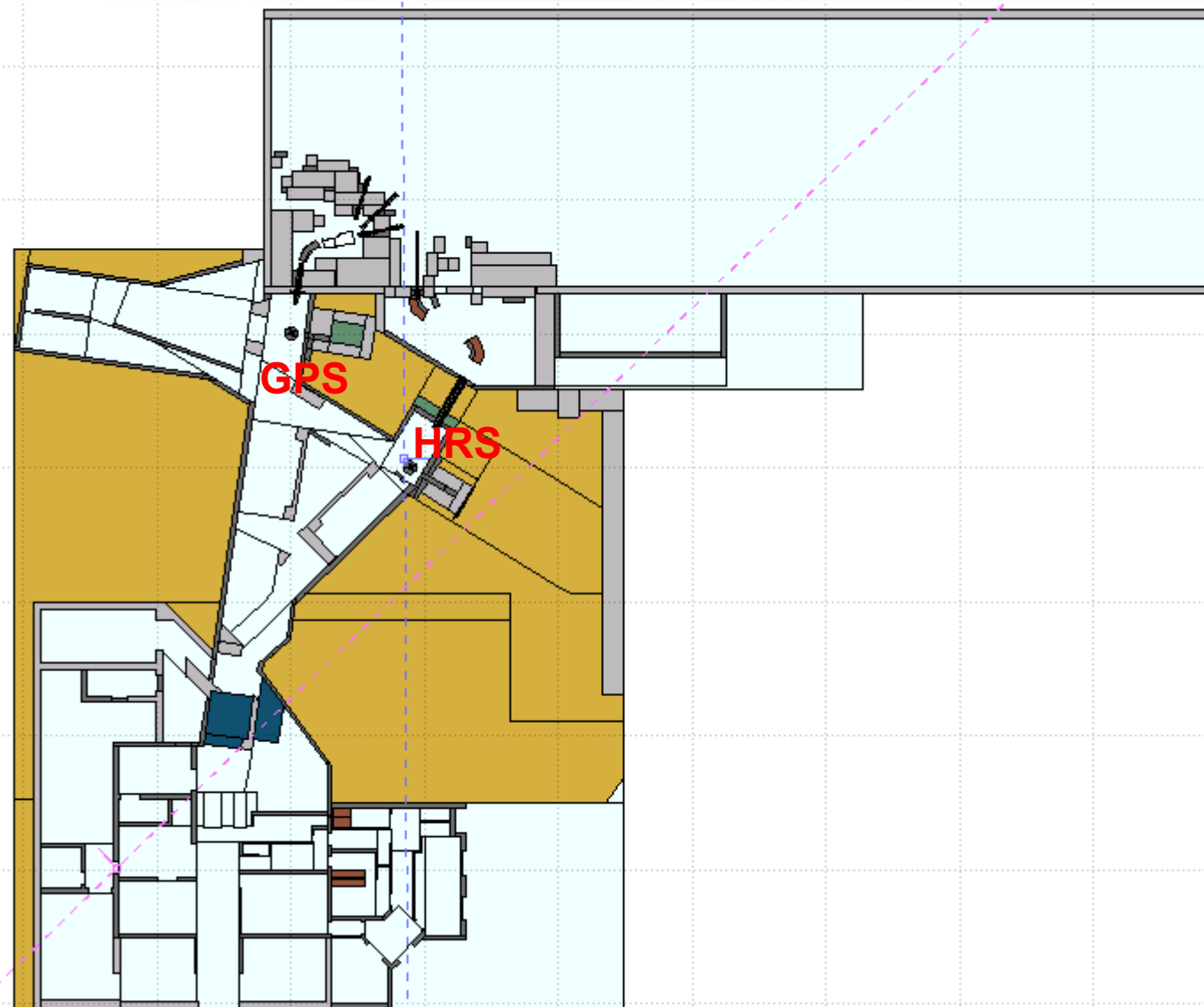
- Introduction
- Work overview
- Some results
- Conclusions

Introduction



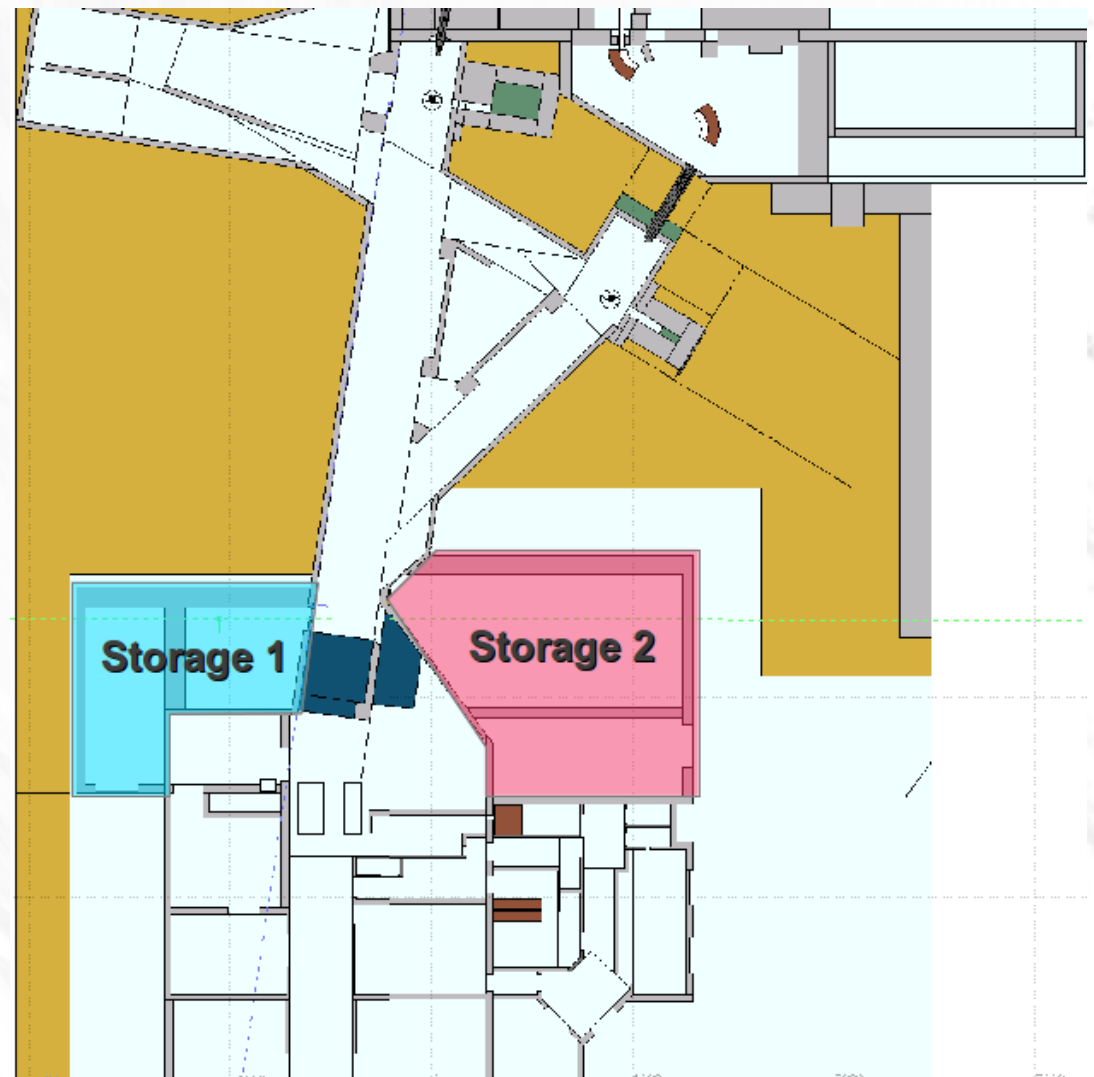
Introduction

Protons
from PSB

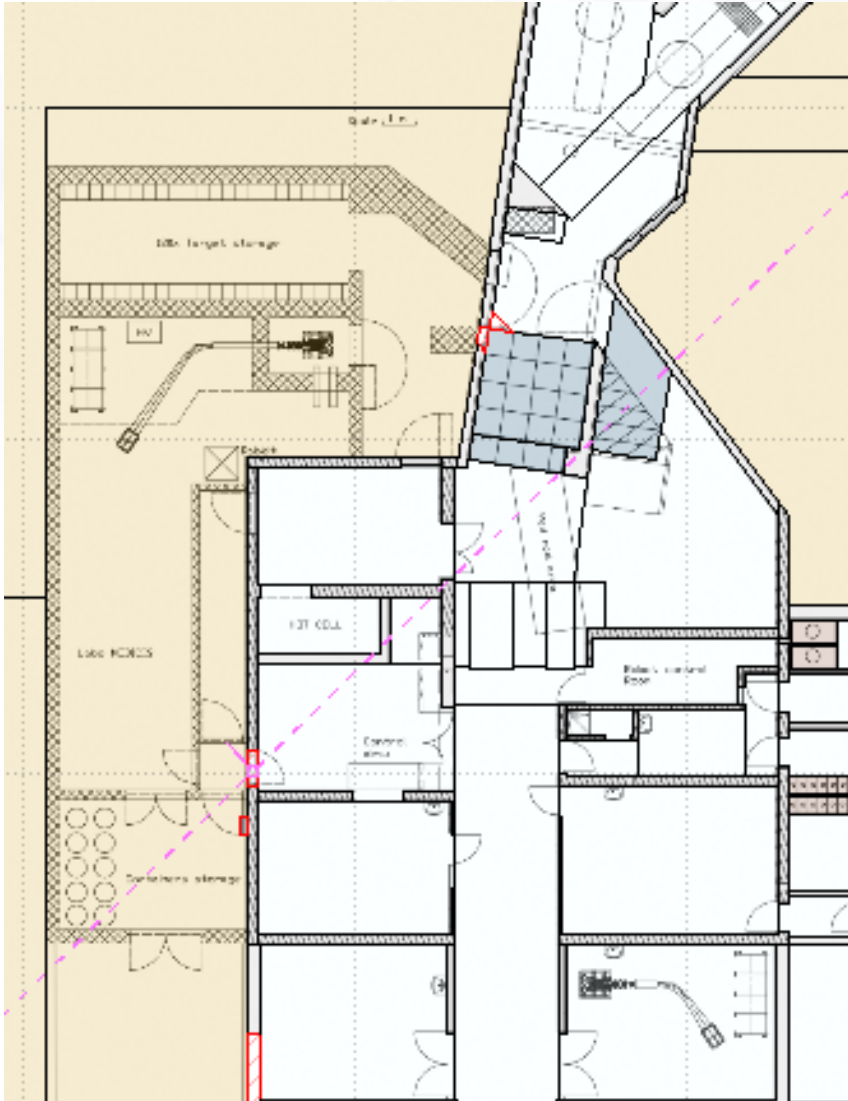


Work overview

Determine most suitable layout for the hot targets' storage

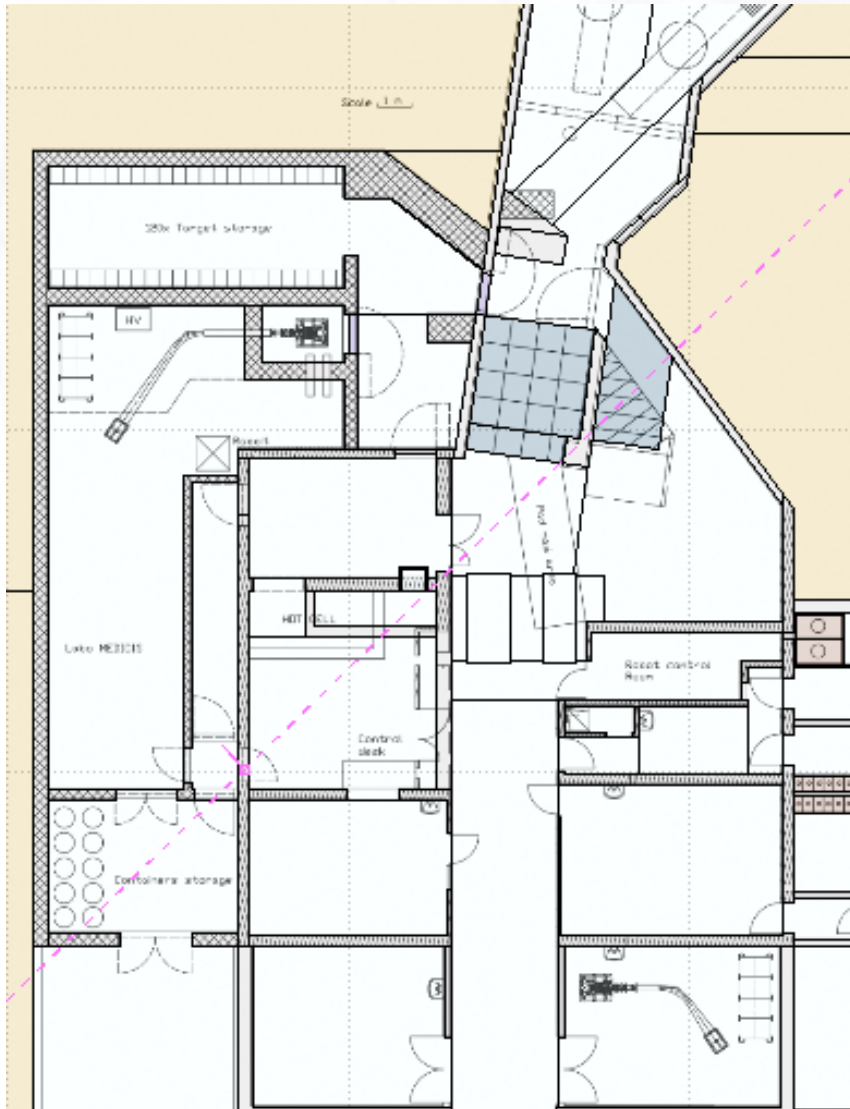


Geometry



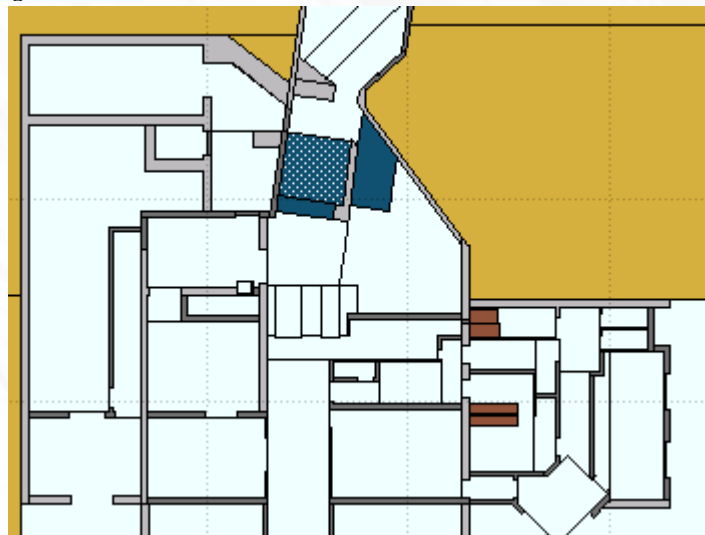
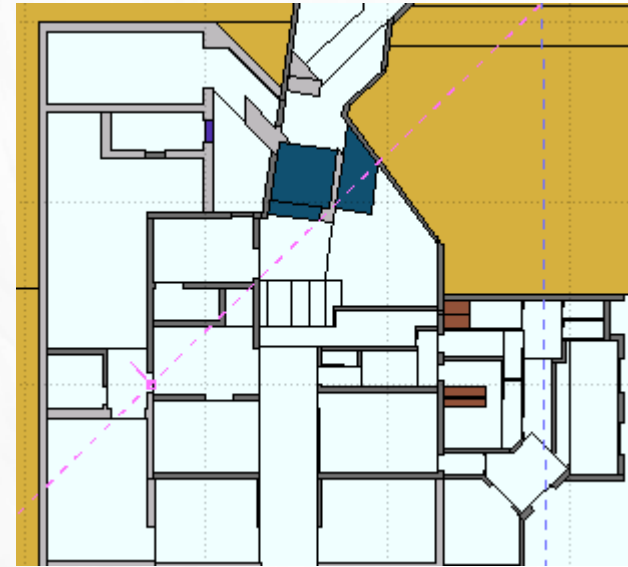
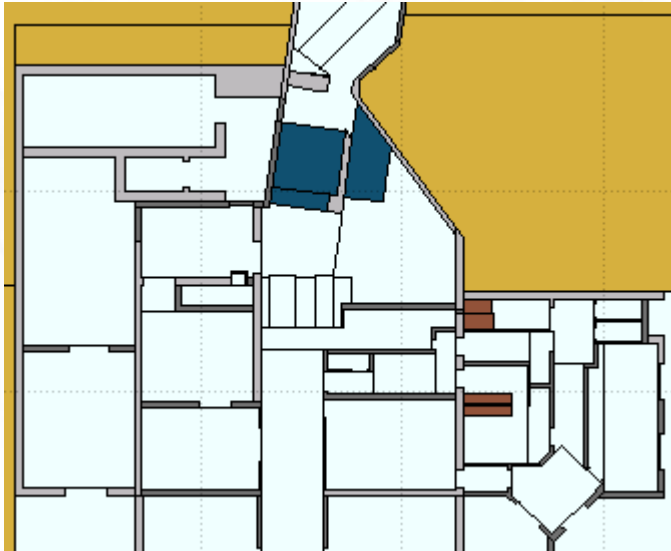
Flair feature allows to superimpose engineering drawings to the geometry... .

Geometry



...resulting in an accurate and faster geometry making.

Geometry



Geometry

Targets

- Tungsten
- Uranium carbide
- Thallium
- Lead

Storage layout

- Storage 1
- Storage 2
- Storage 1 layout 2
- Storage 1 layout 3
-

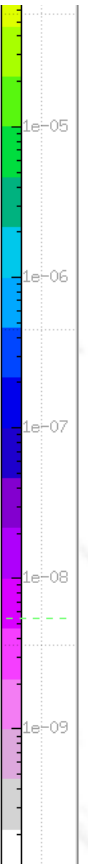
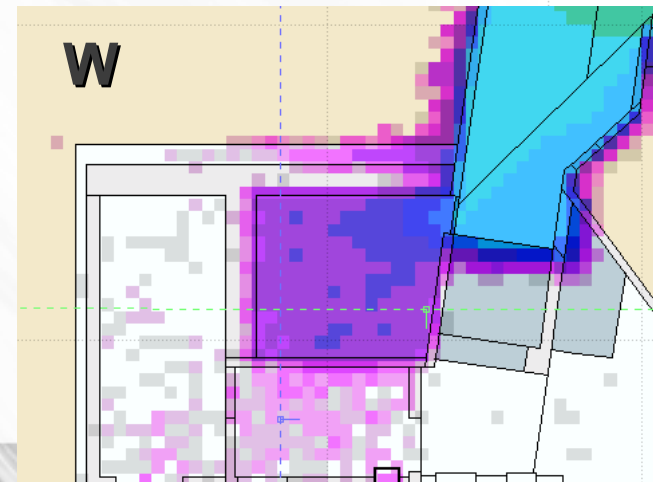
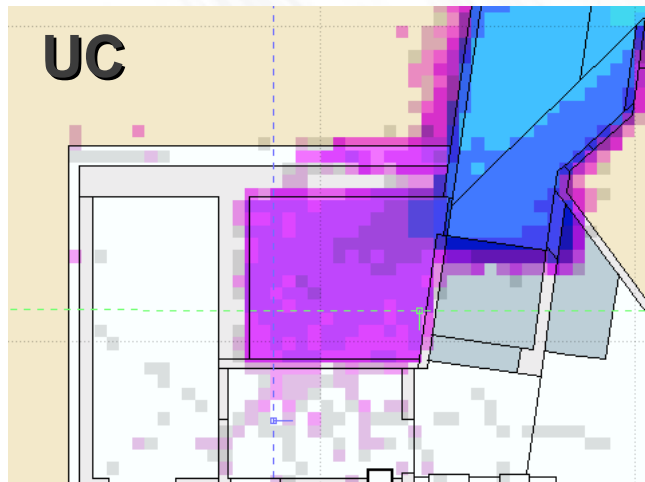
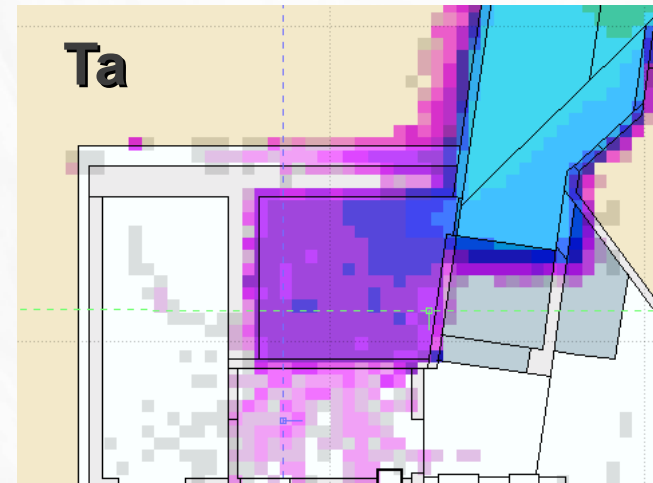
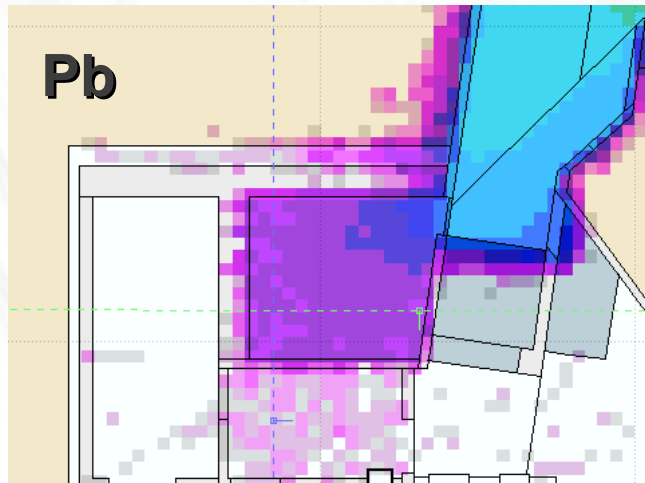
Beam features

- ISOLDE features
- HIE-ISOLDE features

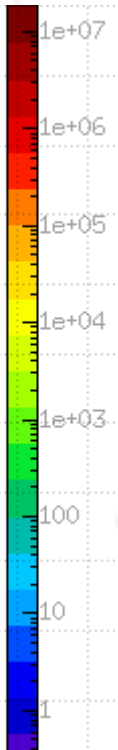
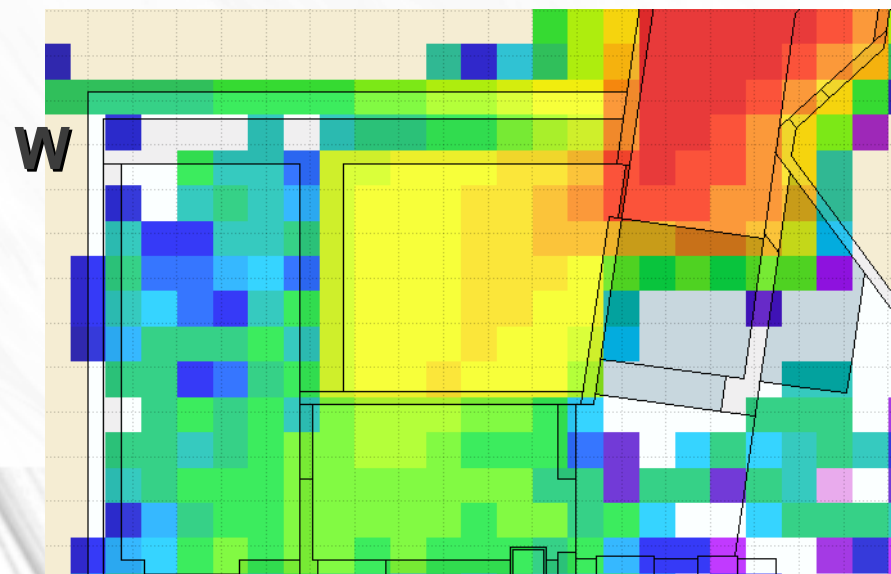
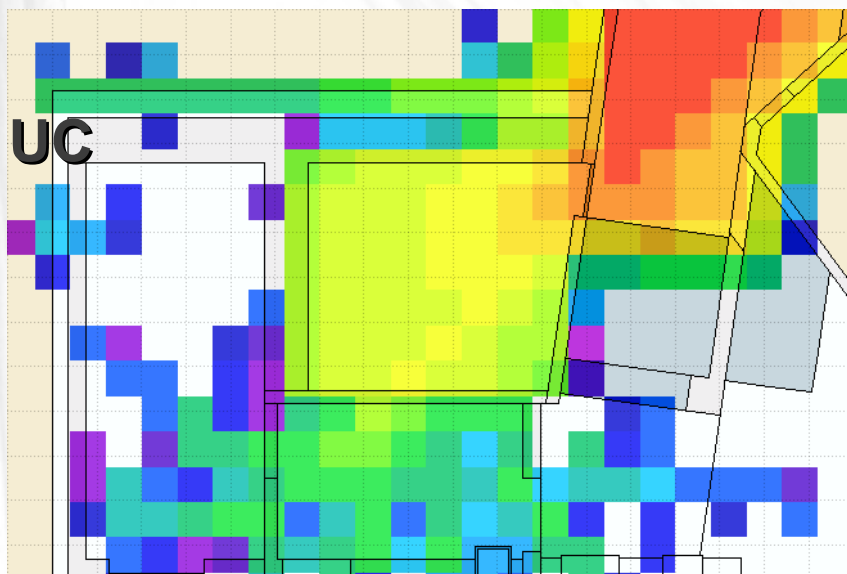
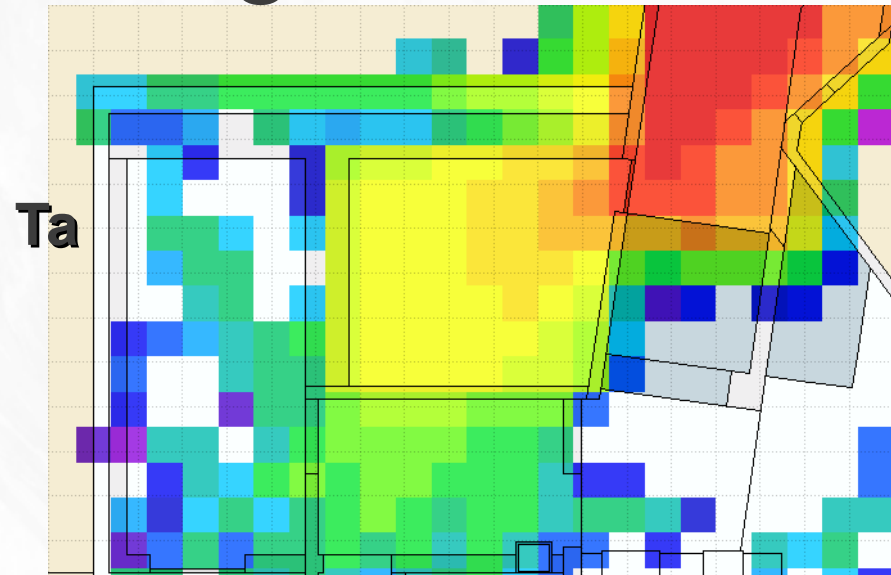
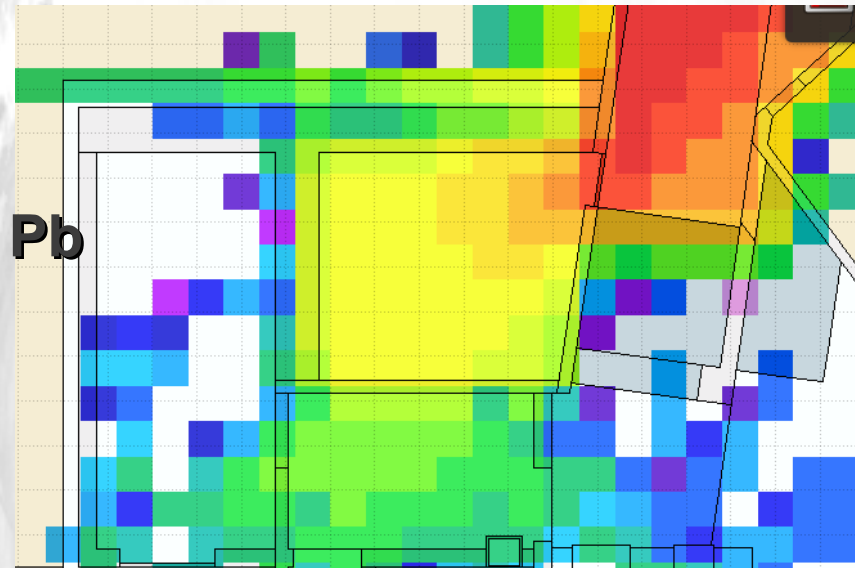
Beam Incidence

- GPS
- HRS

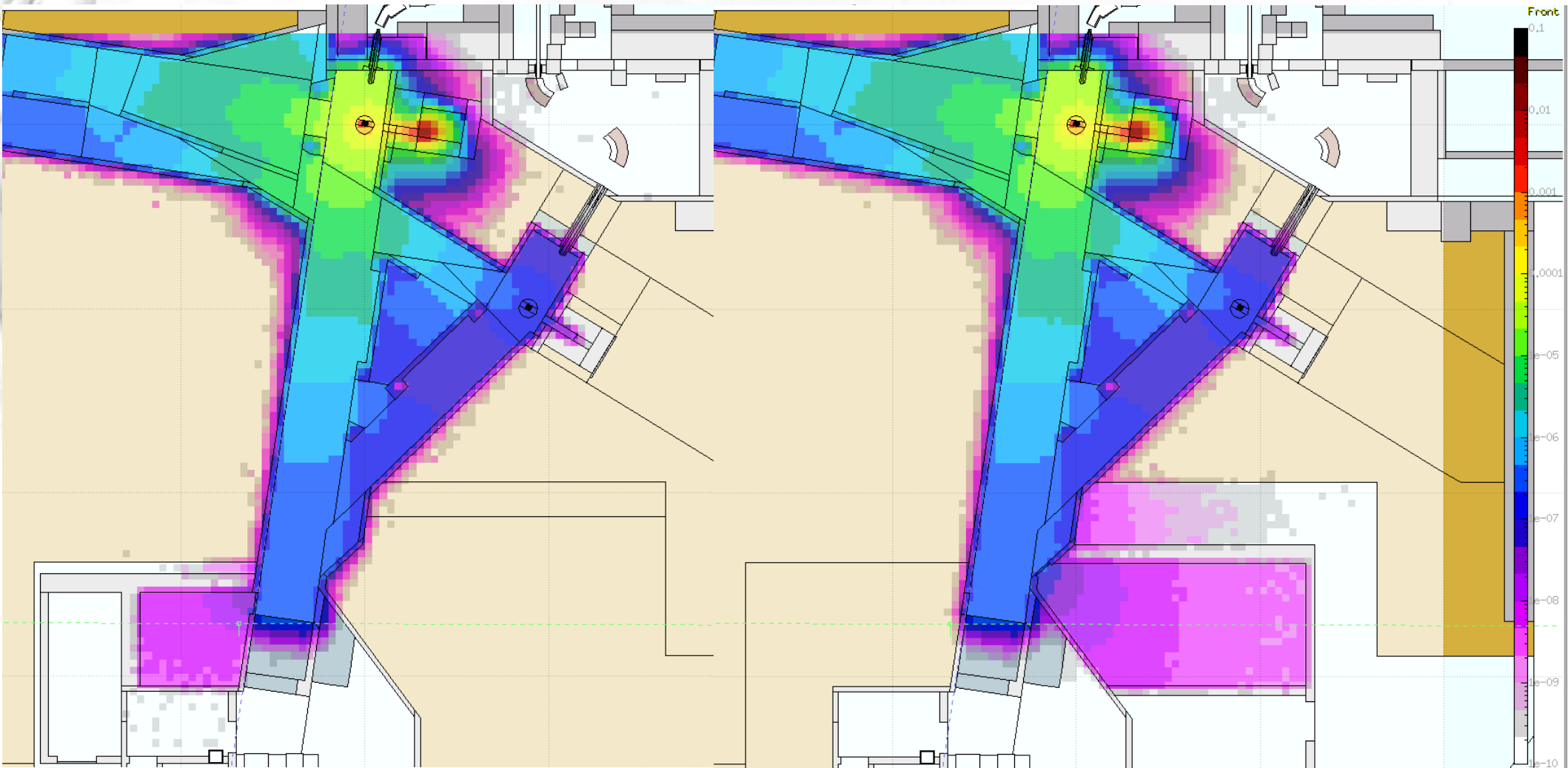
Storage1 neutron flux for different targets



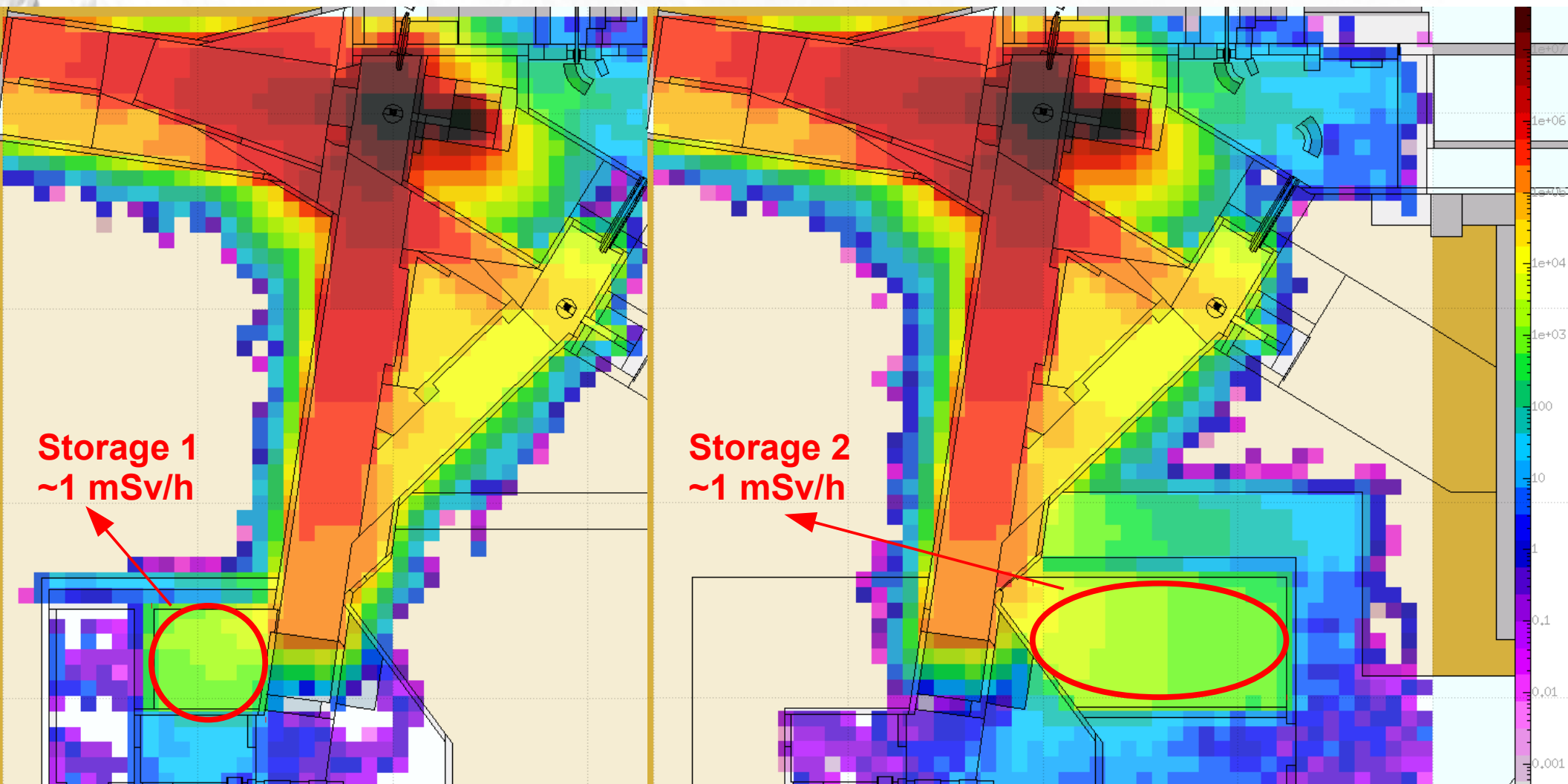
Storage 1 equivalent dose for different targets



Storage 1 vs Storage 2: neutron flux (gross)

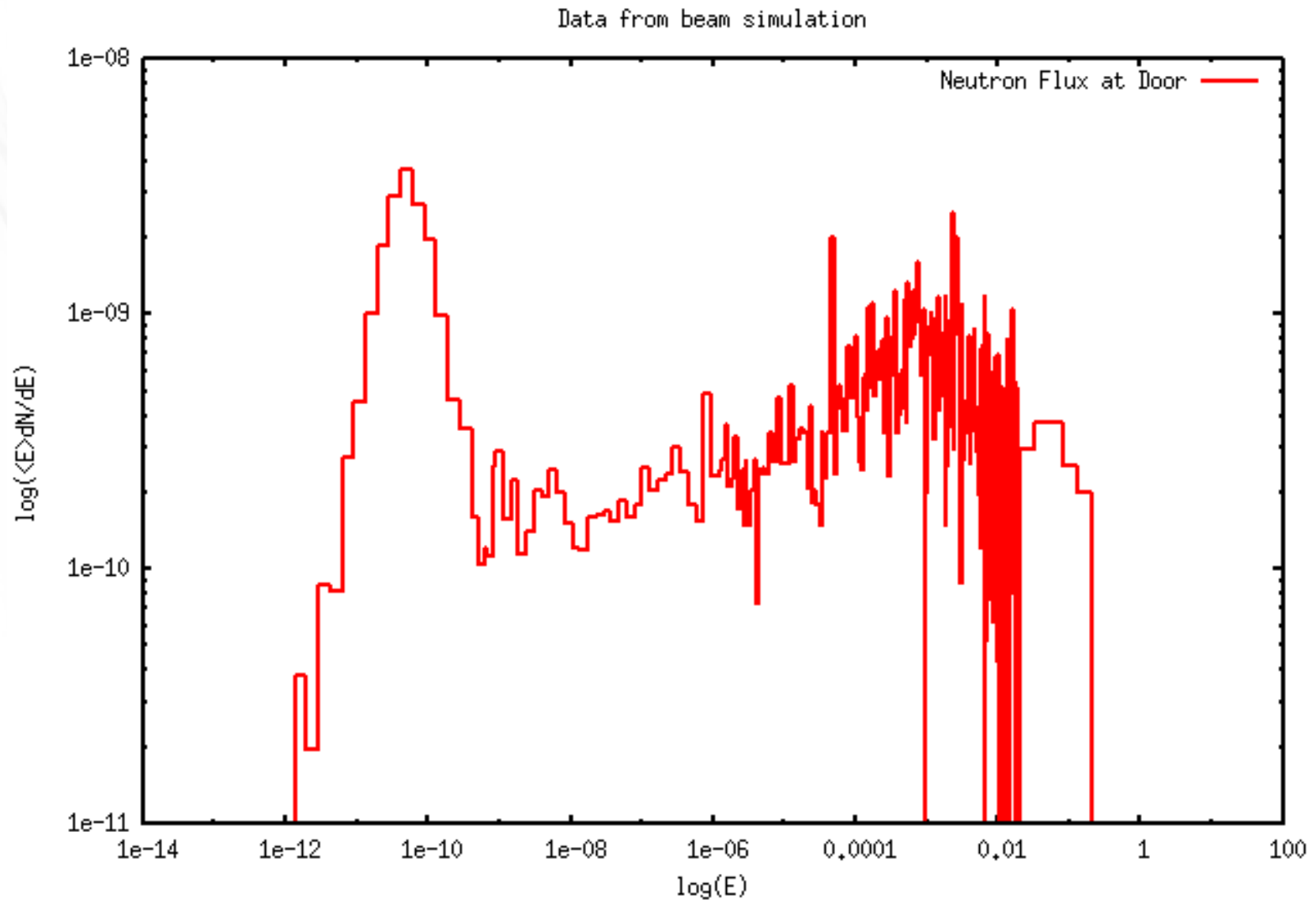


Storage 1 vs Storage 2: equivalent dose ($\mu\text{Sv/h}$)

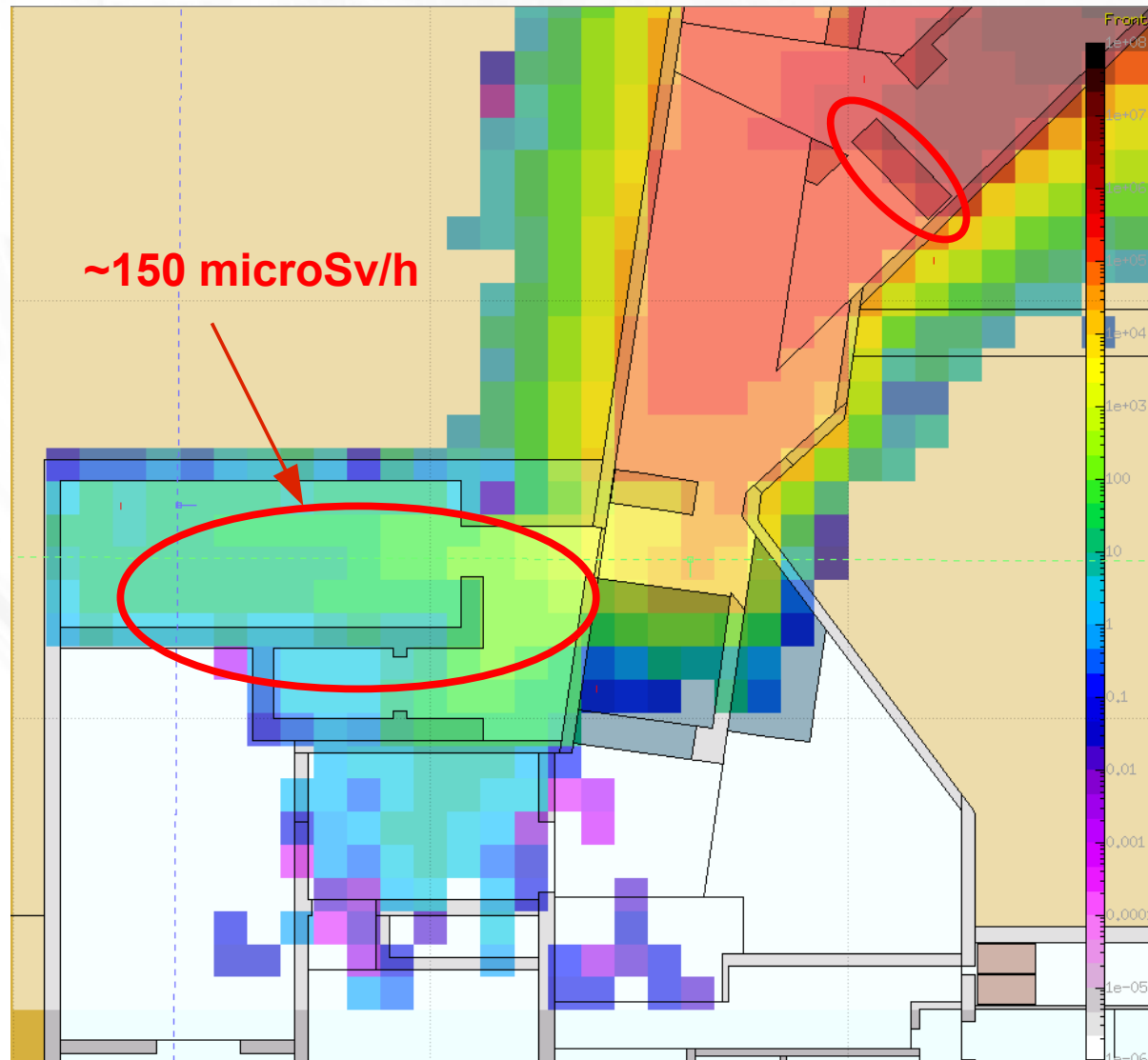


No Target

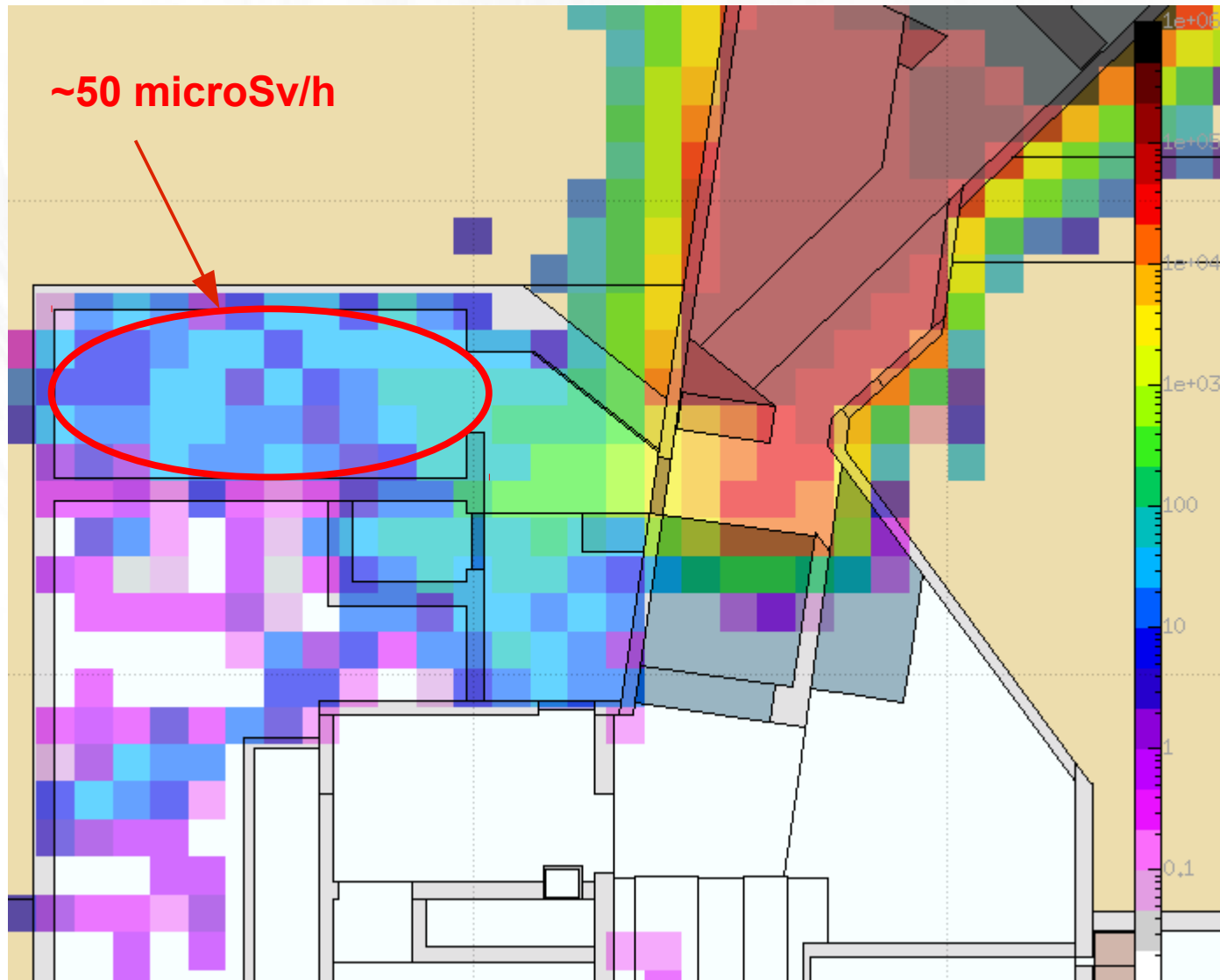
Neutron vs Energy profile incoming through door



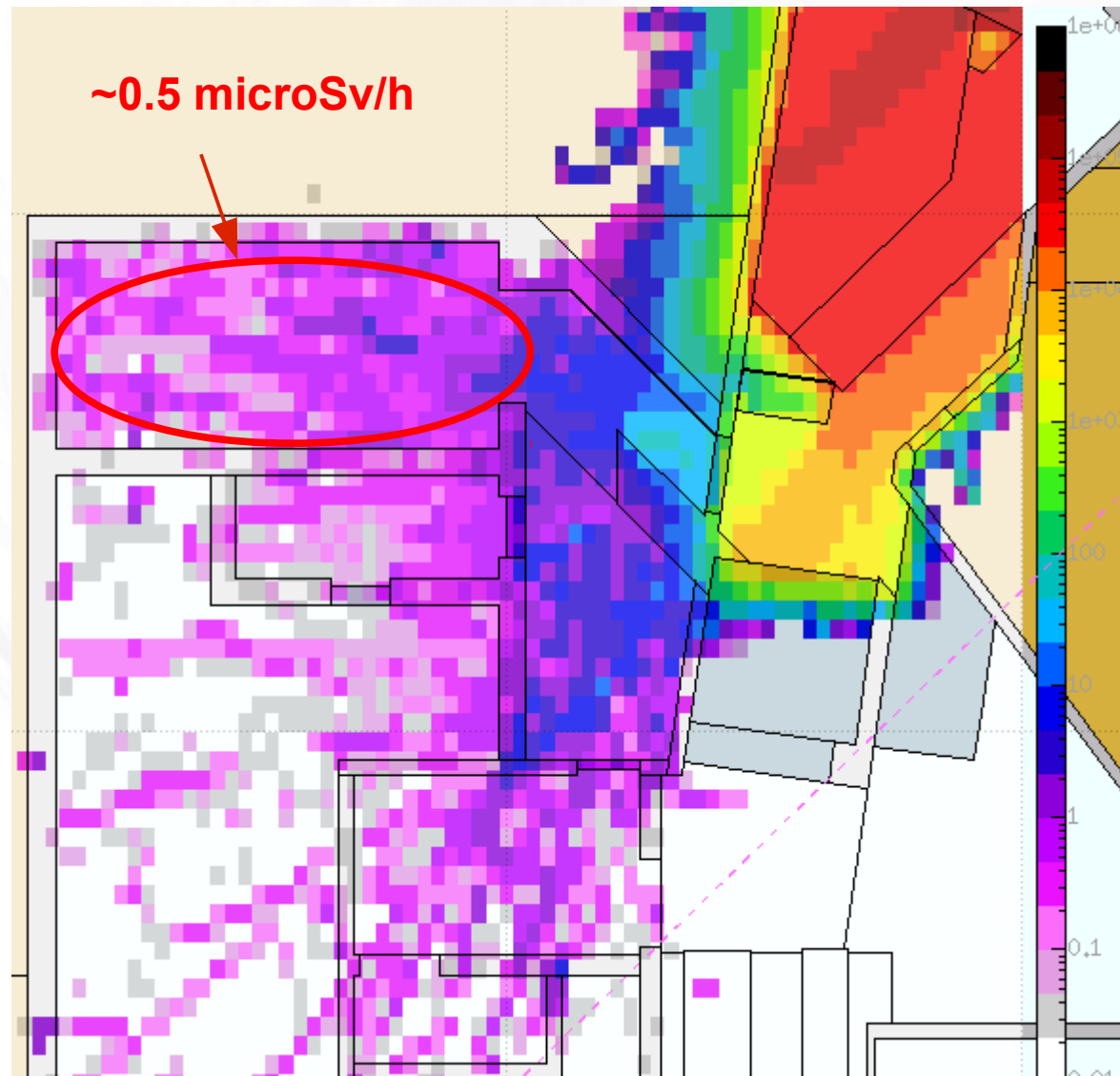
Storage 1 (version 2)



Storage 1 (version 3)



Storage 1 (latest layout)



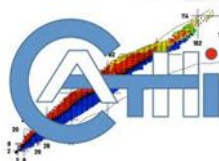
Conclusions

- Some extra shielding is needed
- Geometry flexibility aids while design phase
- Flair speeds up geometry setup

Comming...

- Simulations from profile
- Add hot targets to storage
- Design and benchmarking of targets

Thanks



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