DREAM Heavy Shutter

Results from Simulations

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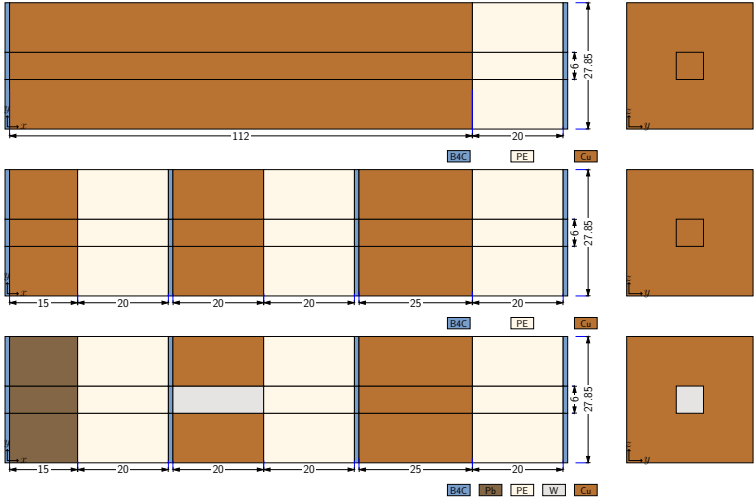
General Considerations

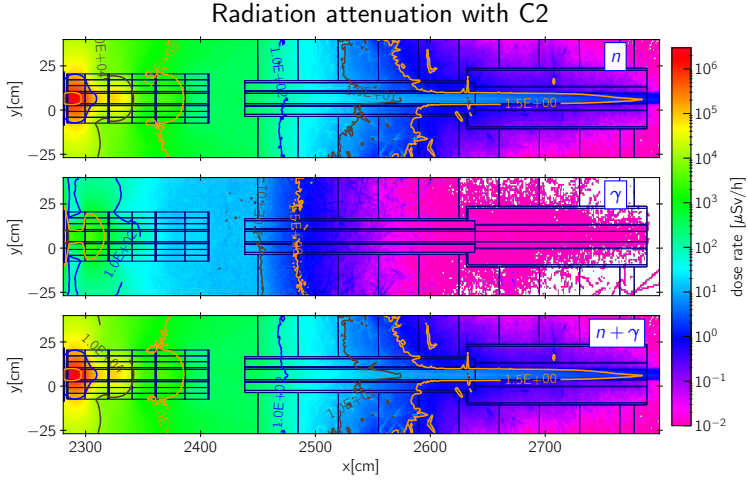
- Shielding and the activation analysis
- Monte Carlo engines: PHITS (transport) and DCHAIN-SP (activation)
- Goal:
  - achieve the 1.5 μSv/h radiation dose rate at the downstream beam side of the bunker feed-through
  - design a heavy shutter stucture with less residual activities

Simulated Geometries



Three configurations: C0(top), C1(middle) and C2(bottom)

Radiation Attenuation

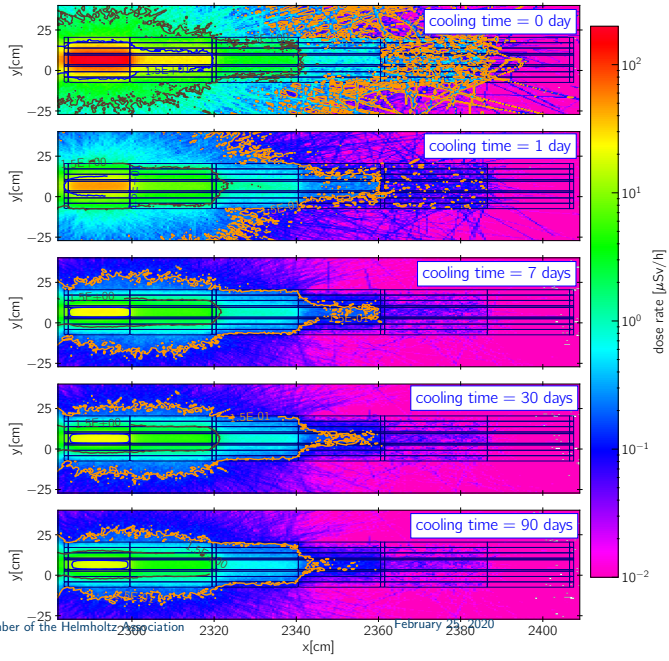


Activation Analysis (1)

Simulation setup:

- 10 years continuous irradiation corresponding to the 5 MW proton beam,
- 90 days cooling period

Activation Analysis (2)



Distributions of the photon dose rate from the activation of the heavy shutter C0.

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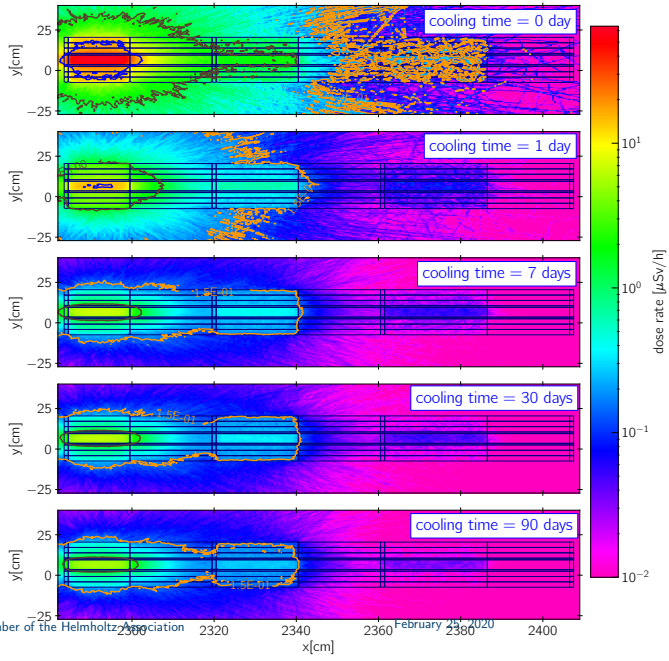
Activation Analysis (3)



Distributions of the photon dose rate from the activation of the heavy shutter C1.

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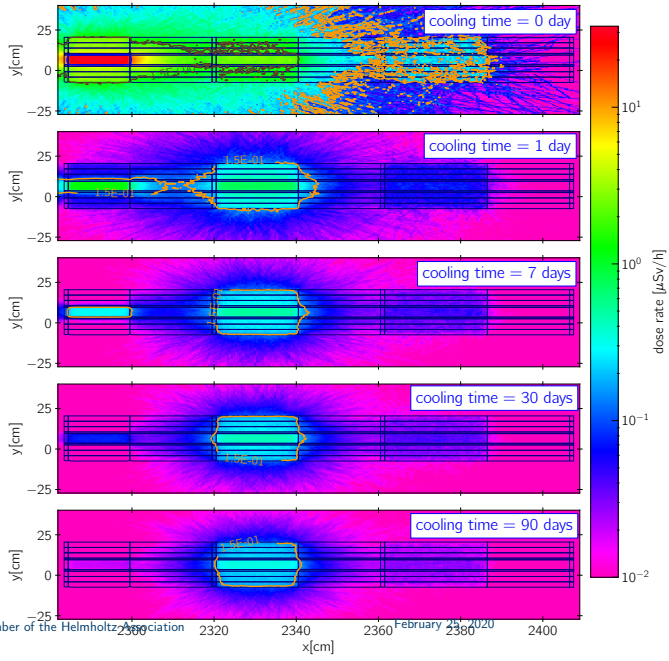
Activation Analysis (4)



Distributions of the photon dose rate from the activation of the heavy shutter C2.

Heavy Shutter for DREAM