DREAM shielding and optics

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Requirements
- 0.5Å < **λ** typical pulse width 150µs
- 1cm^2 focus 0.5° divergence

beam line
- straight

neutron optics
- 1.5 < **m** < 5

Shielding estimates from

POWTEX cave - secondary gamma production

DREAM worst case scenario

5 MW, **10^{10} n/s** on a FeCd sample, no choppers,

MAGIC cave shielding - 1m concrete

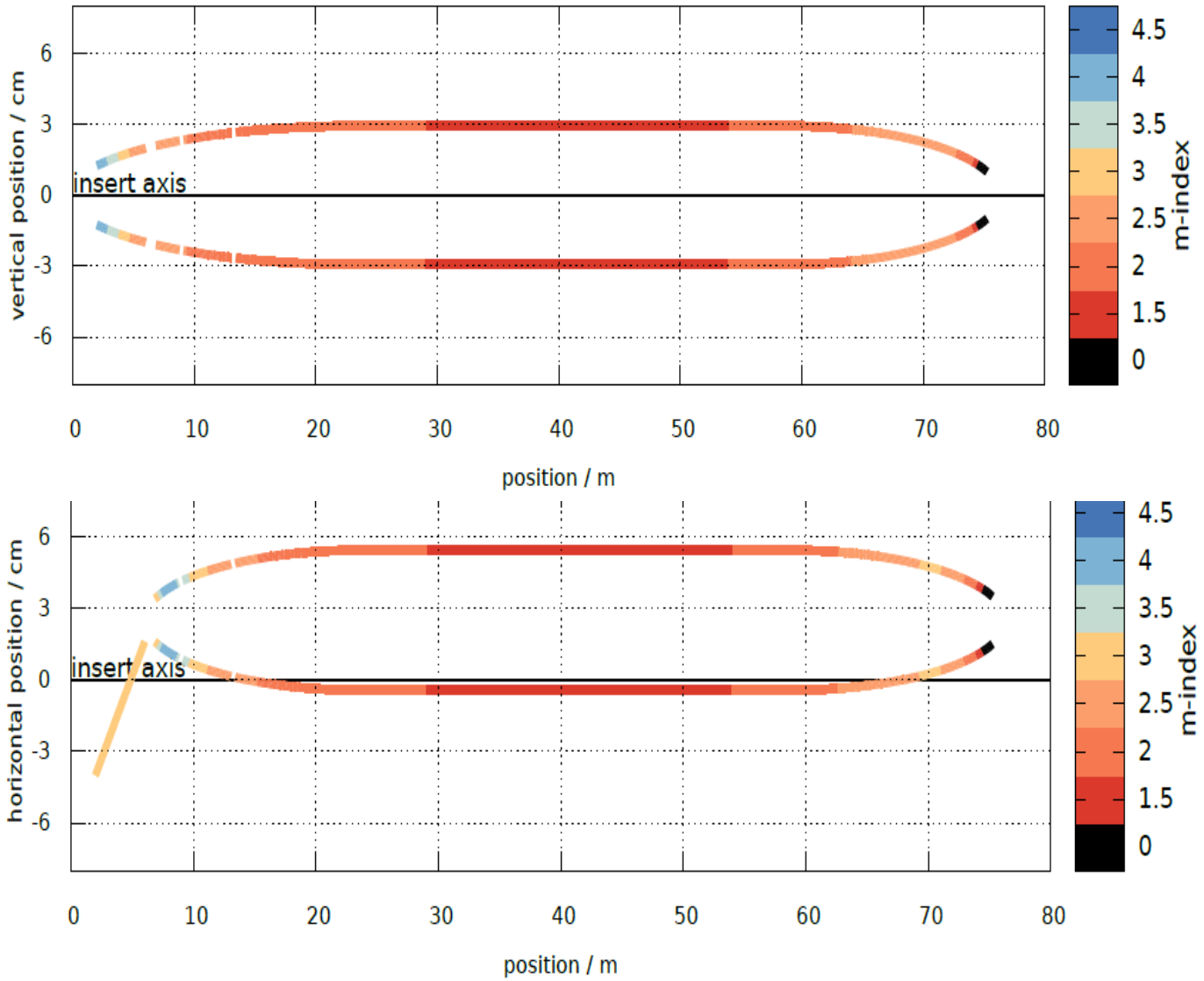
ODIN shielding for straight guide

Shielding materials and costing

MLZ – bunker heavy concrete *vs* steel / B-PE

DREAM neutron guide optimized coating for 0.5 Å

Nicolo Violini



DREAM neutron guide optimized coating for 0.5 Å

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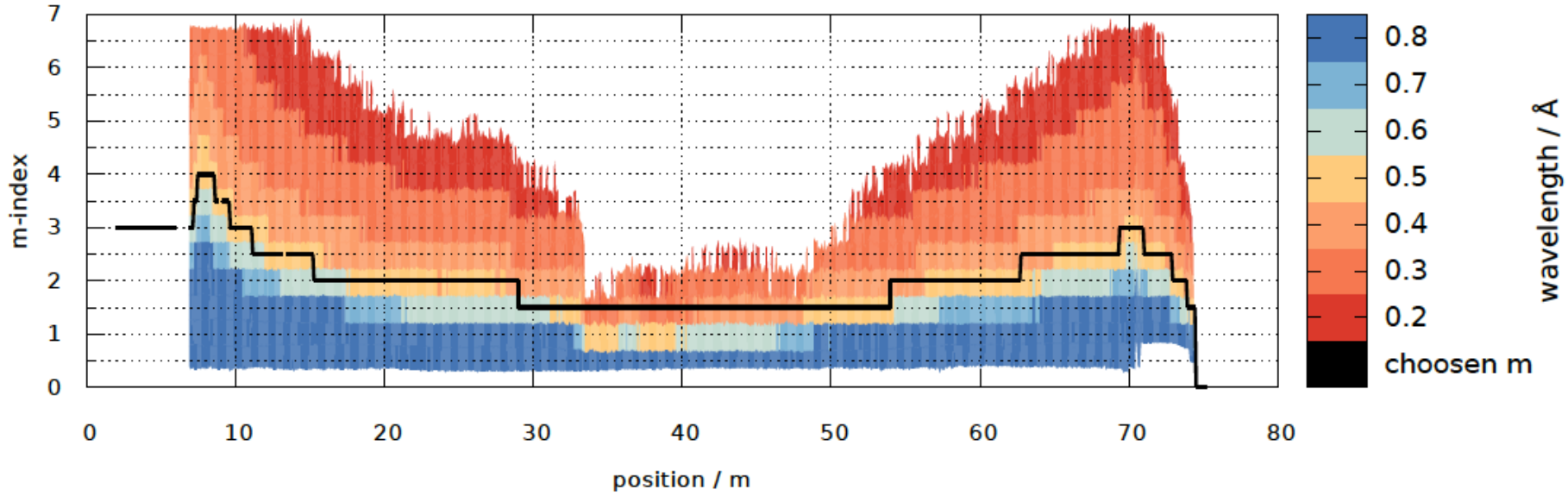
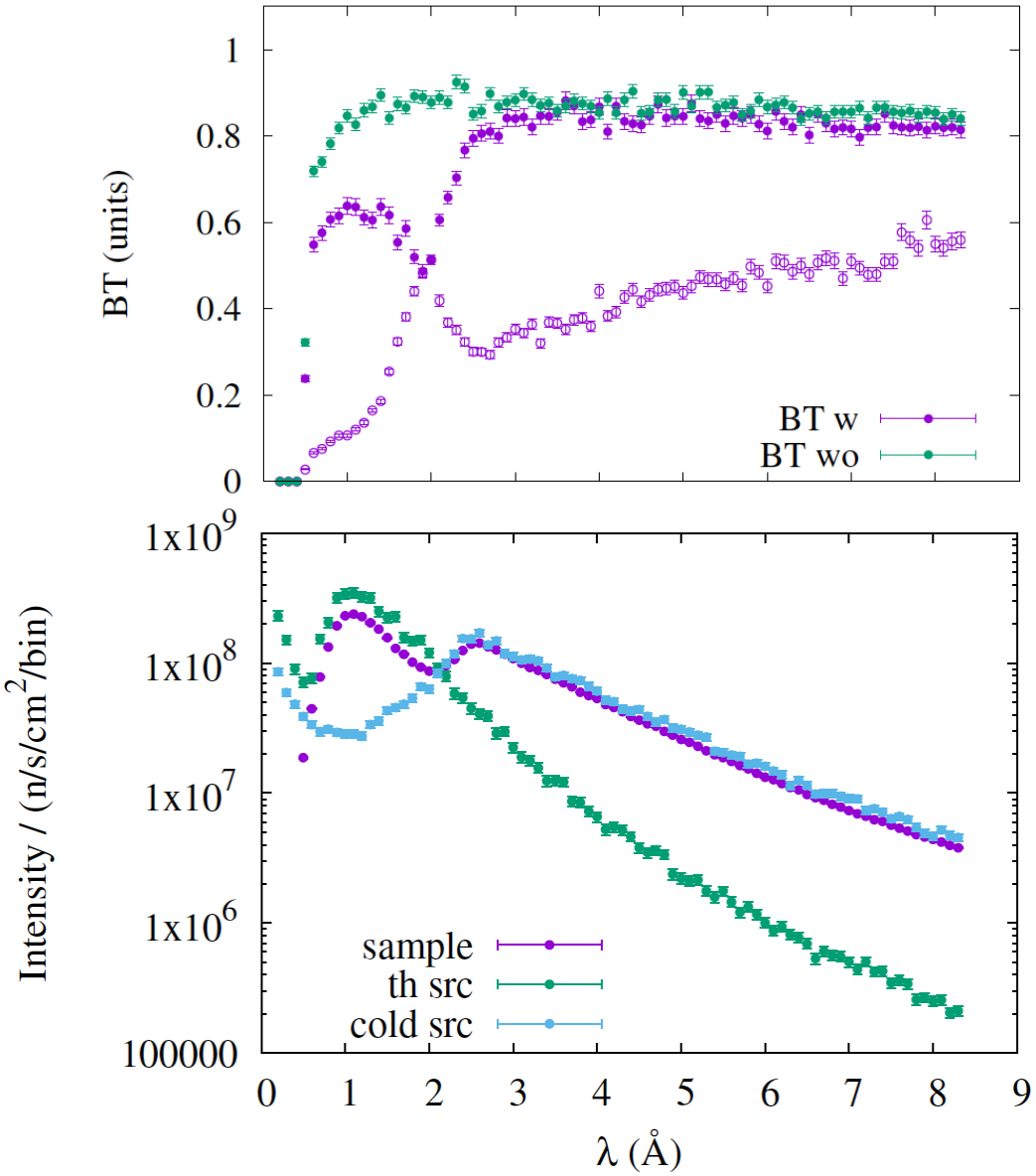


DREAM flux at sample

Nicolo Violini

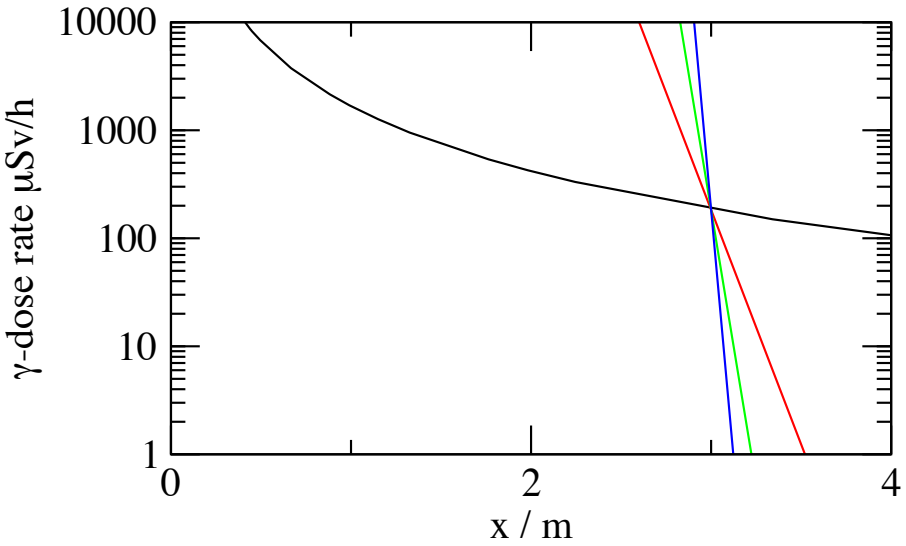
10^{10} n/(cm^2 s)

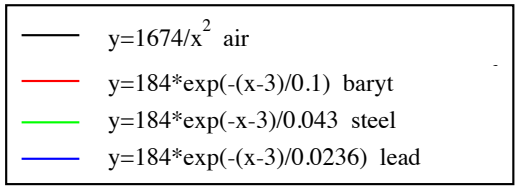
0.5Å < **λ**



Shielding estimates from POWTEX

cave - secondary gamma production

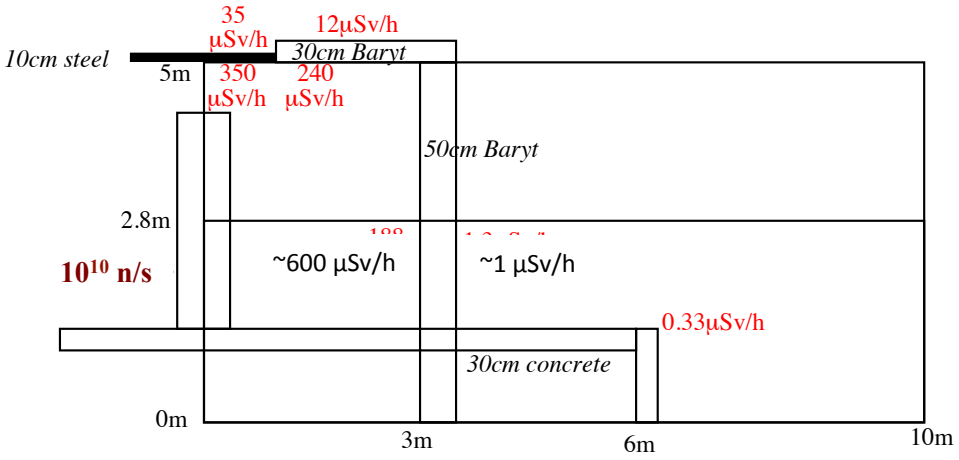




1cm^3 FeCd - worst case sample

γ spectra and attenuation from Florian Gruenauer

Werner Schweika, 25.8.2014



27 cm steel

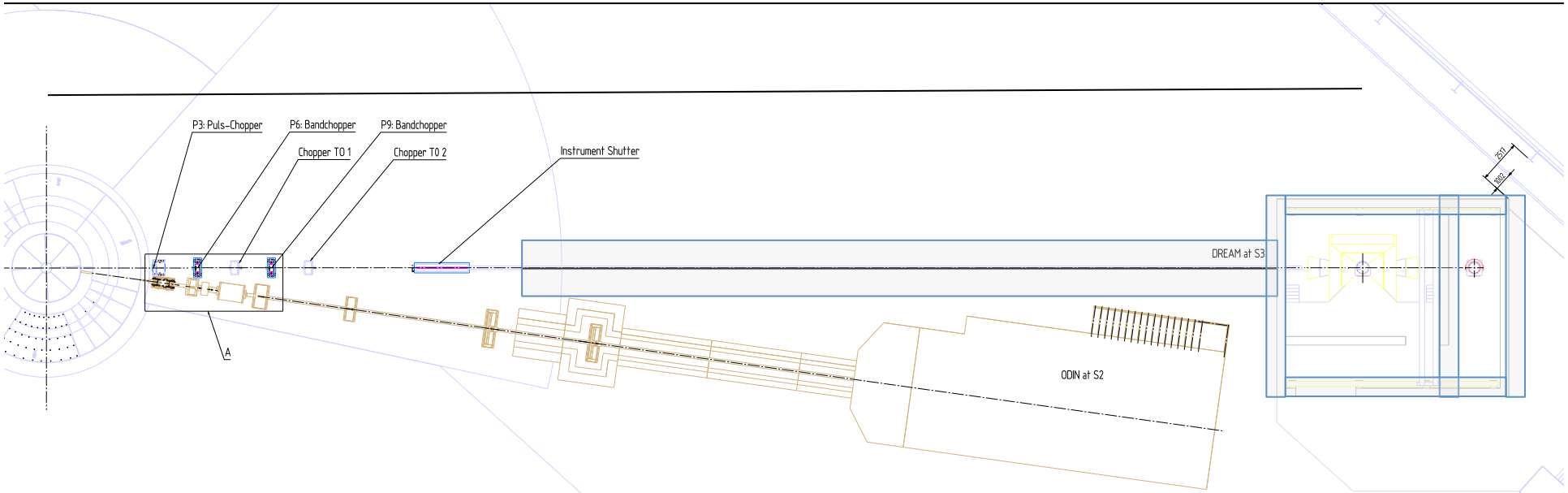
DREAM 1*10^{10} n/s

full pulse low resolution, butterfly moderator
27 cm steel
or ~100 cm concrete

10 cm steel ~ 1order of magnitude for hard gammas

DREAM powder diffraction

DREAM @ S3



GUIDE (similar for CAVE)

<500 m^3 concrete x ~1000 Euro/m^3

<50 m^3 steel x 8t/m^3 x ~1000 Euro/t

2 MEuro

CAVE

γ-shielding

is fine for fast n

add some steel forwards

Specification and costing of components for straight instrument concept

T0	~250 000 Euro
heavy shutter	see solution at MLZ