

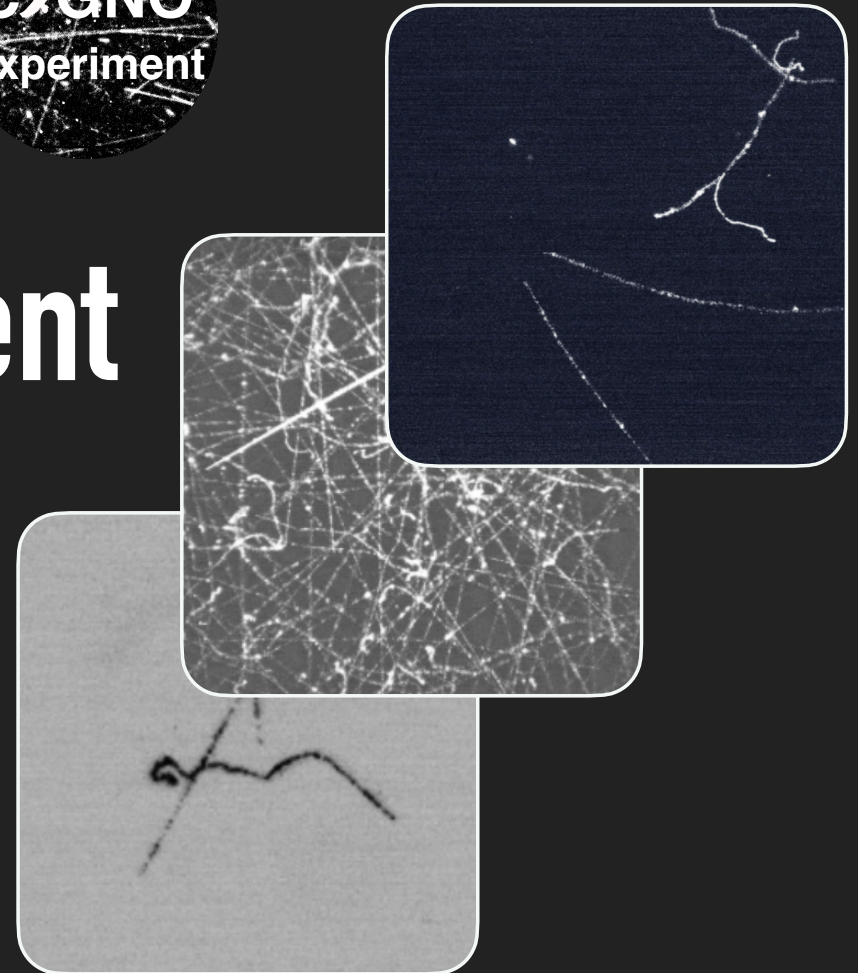
# CYGNO-04

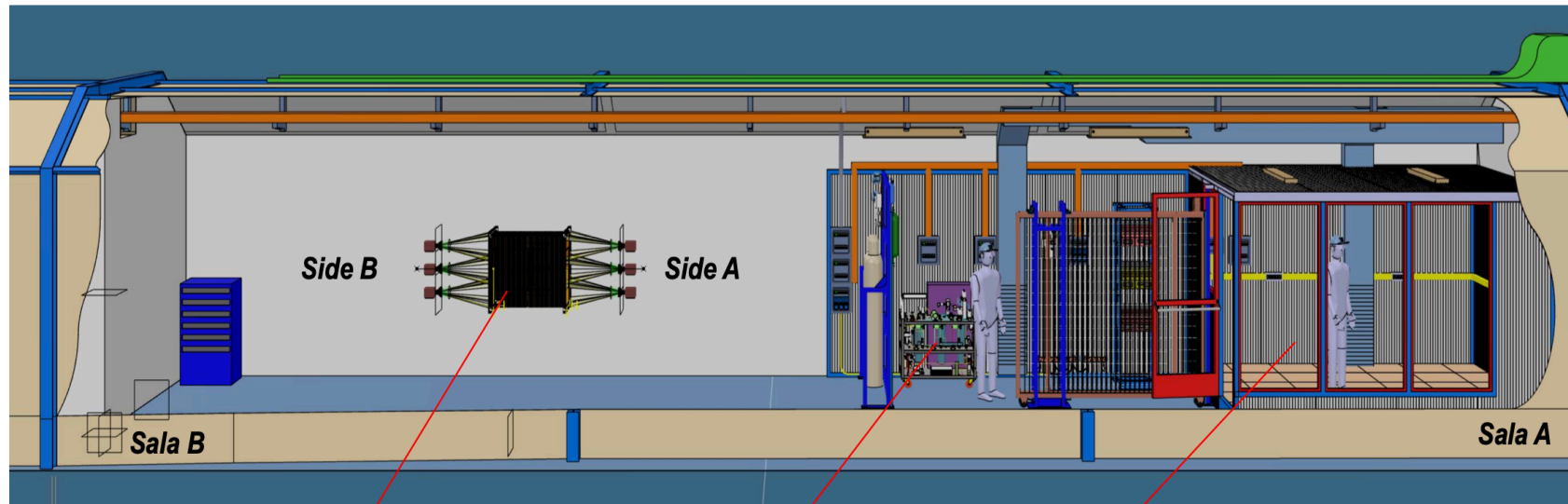


## Background assessment status

MELBA D'ASTOLFO

[melba.dastolfo@gssi.it](mailto:melba.dastolfo@gssi.it)

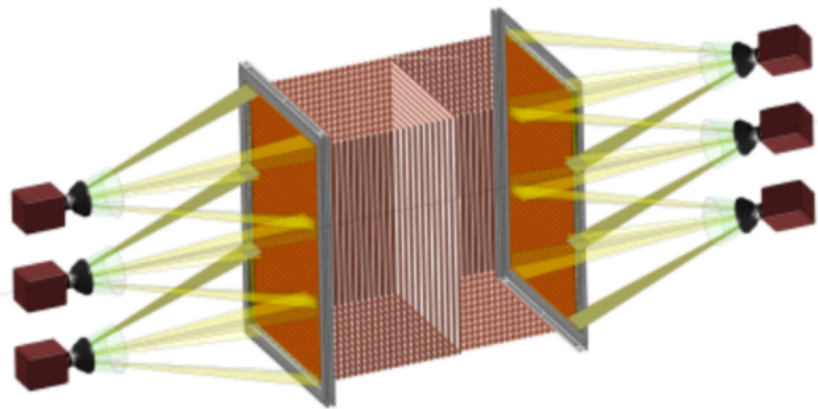




CYGN0\_04

SERVICE AREA

CONTROL ROOM



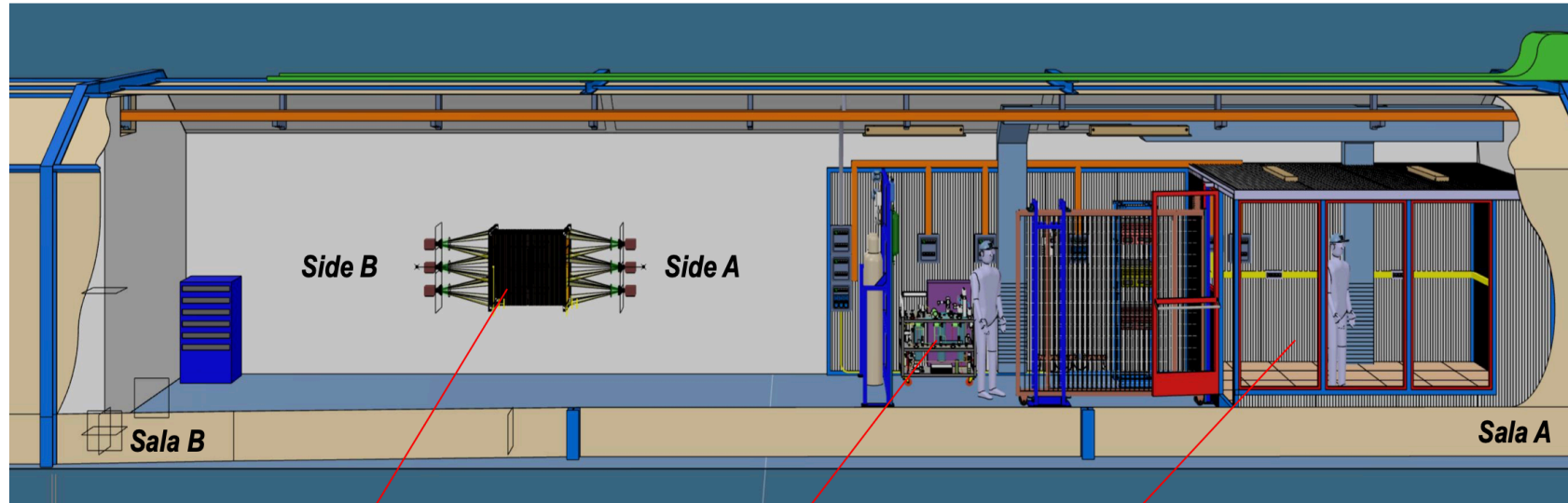
Back-to-back 0.4 m<sup>3</sup> TPC, with central cathode



Triple 50 um GEMs amplification per side



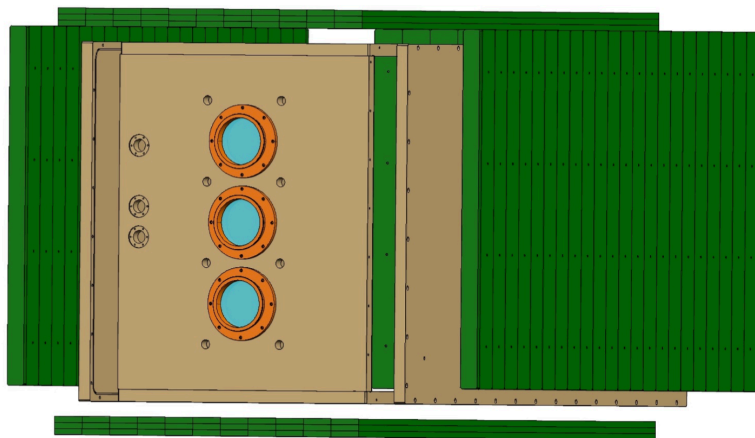
3 sCMOS ORCA Quest per side + 8 PMTs per side



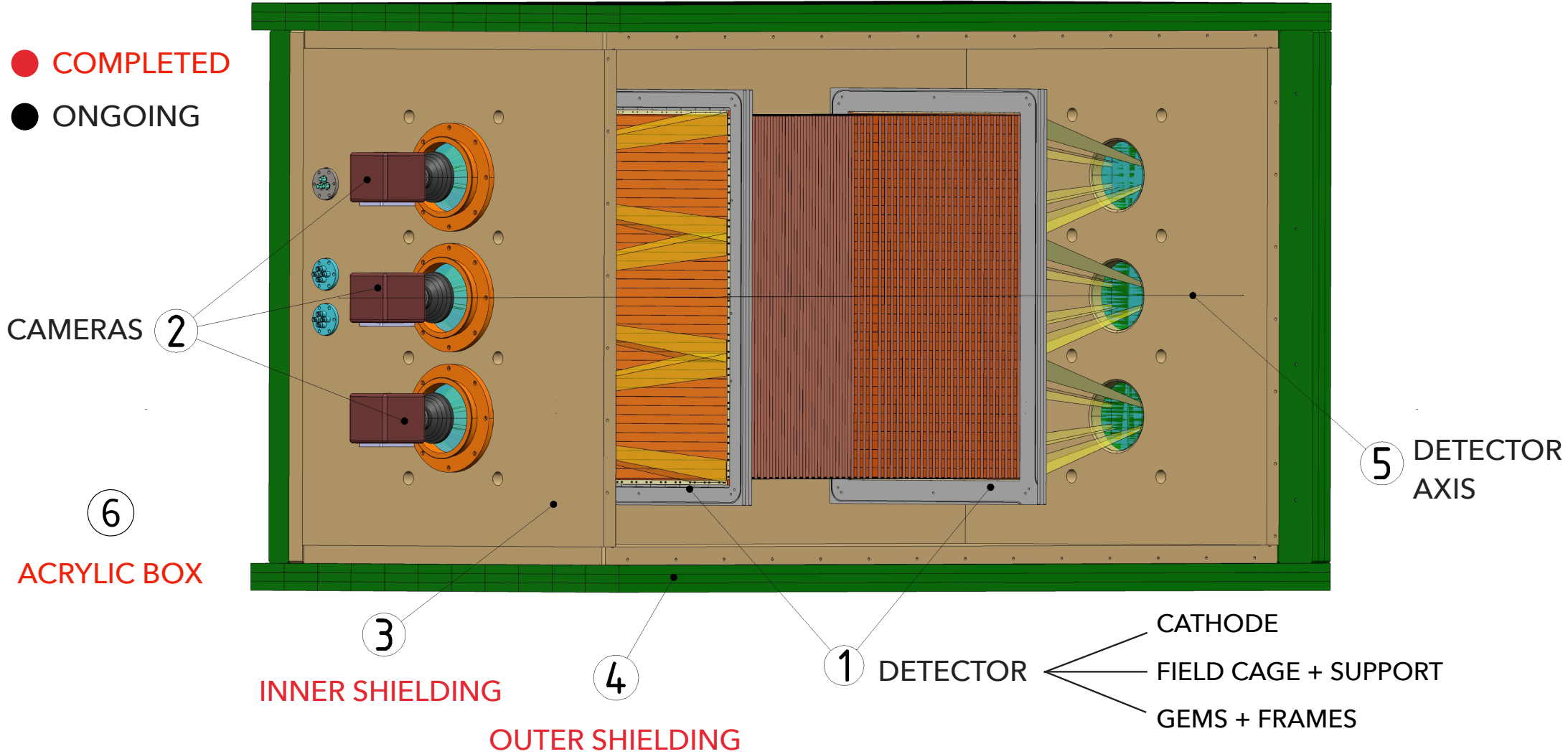
CYGNO\_04

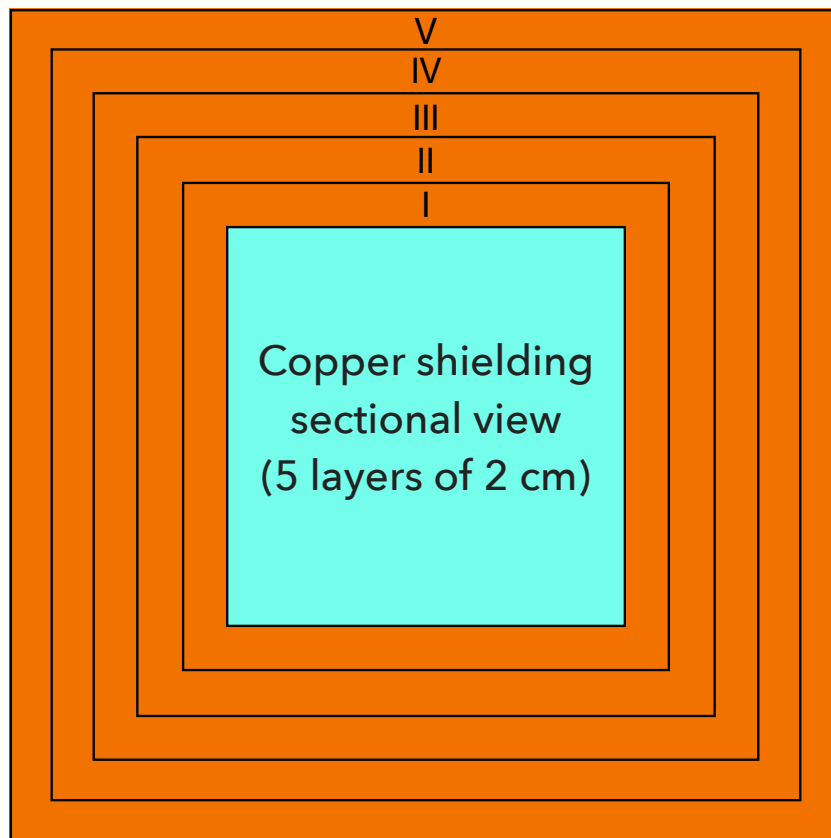
SERVICE AREA

CONTROL ROOM



Shielding composed of 10 cm Cu  
+ 100 cm H<sub>2</sub>O





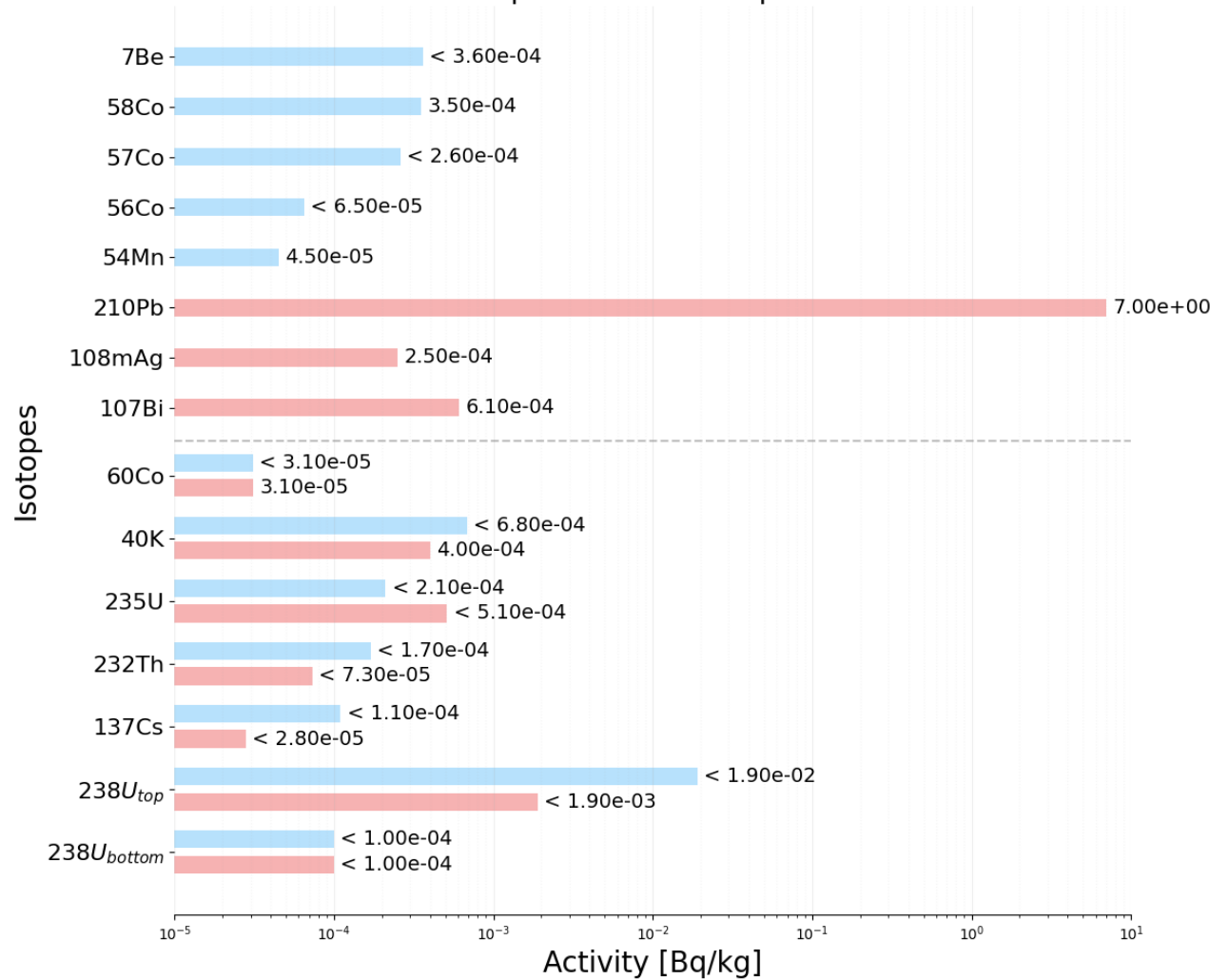


OPERA COPPER



SCHRIEBER COPPER

Isotope Activities Comparison



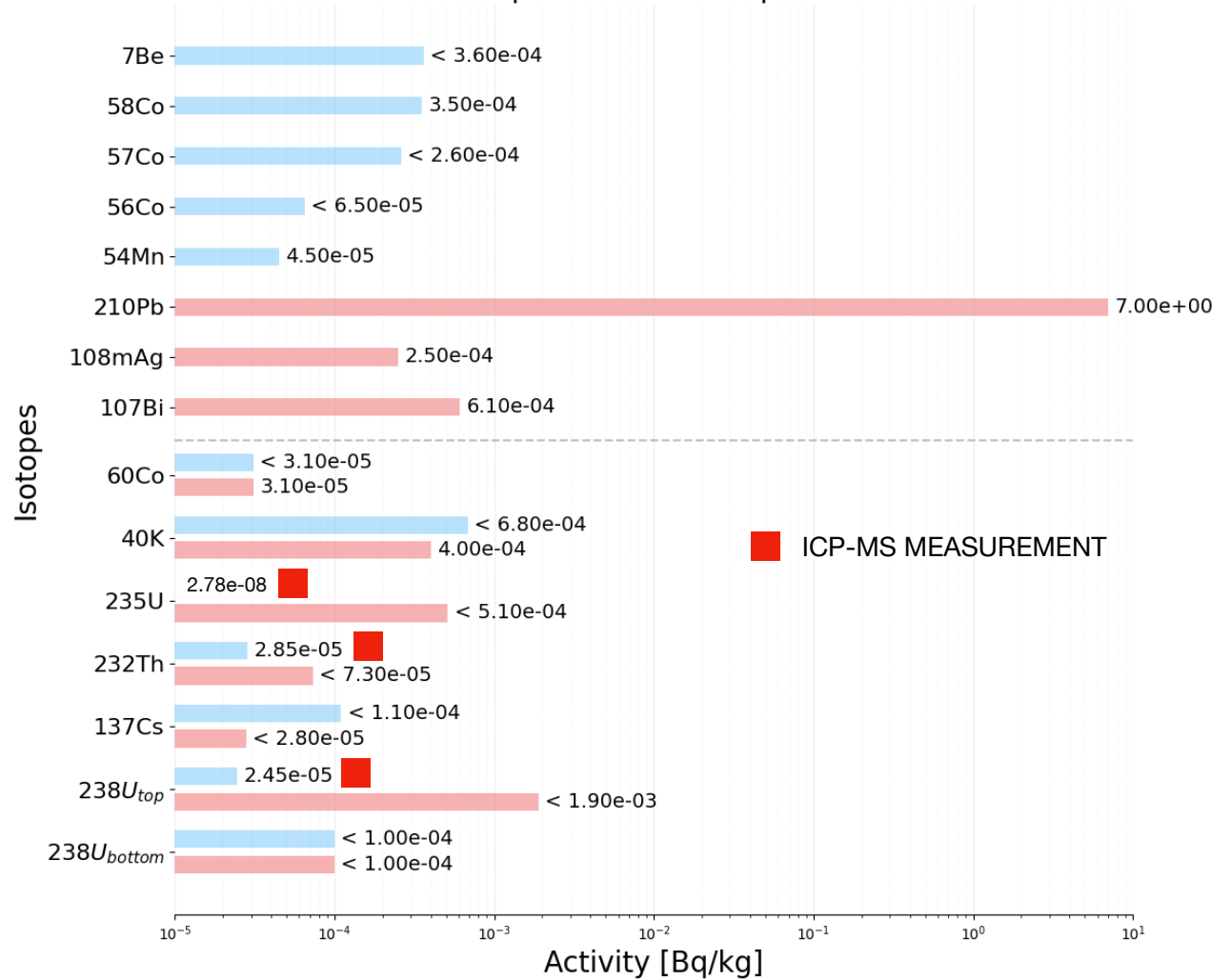


OPERA COPPER



SCHRIEBER COPPER

Isotope Activities Comparison



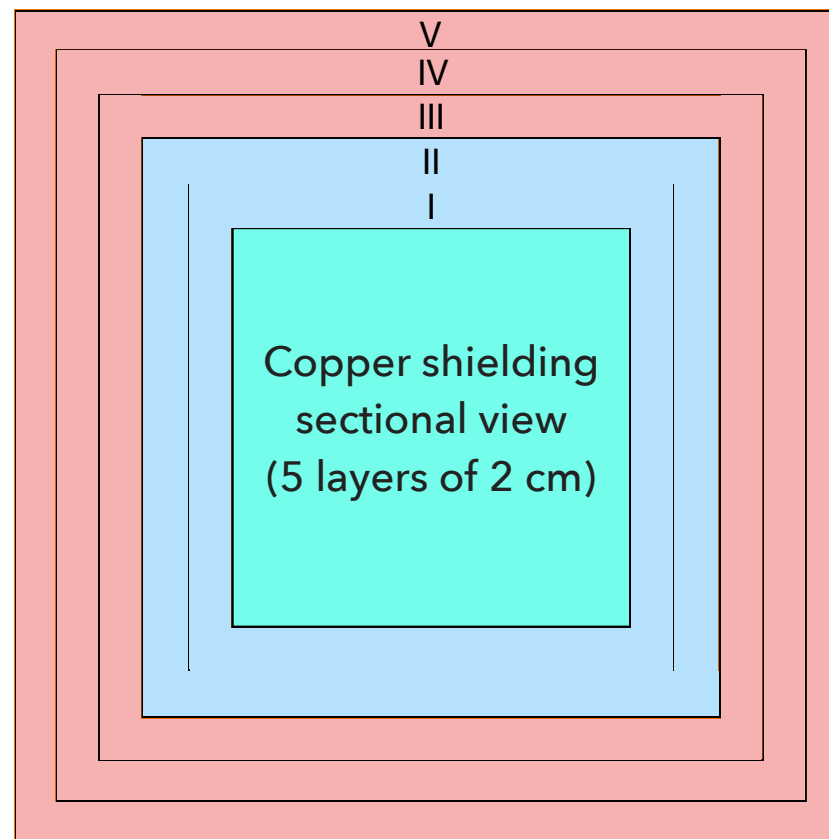




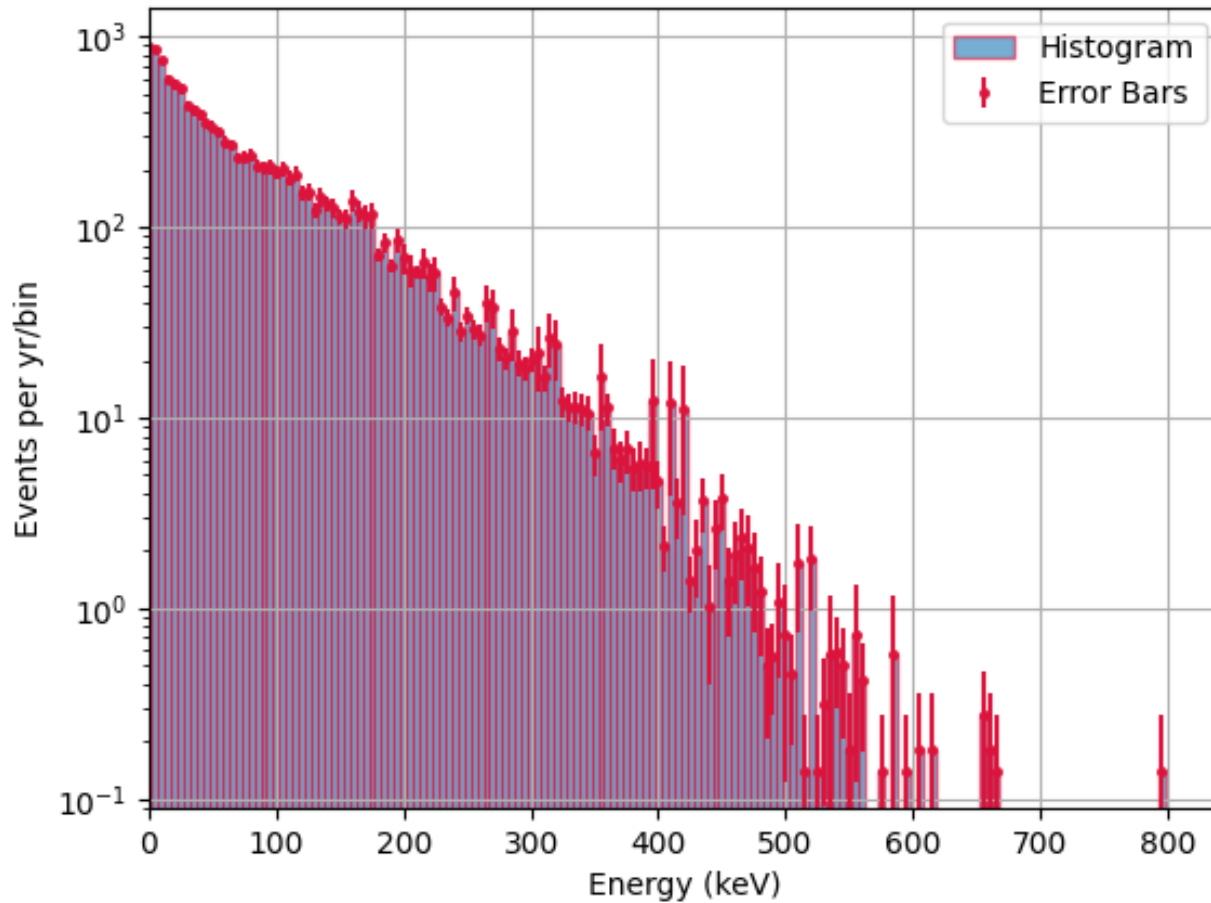
 OPERA COPPER



 SCHRIEBER COPPER







## Key event rates

Low energy range [1,20] keV

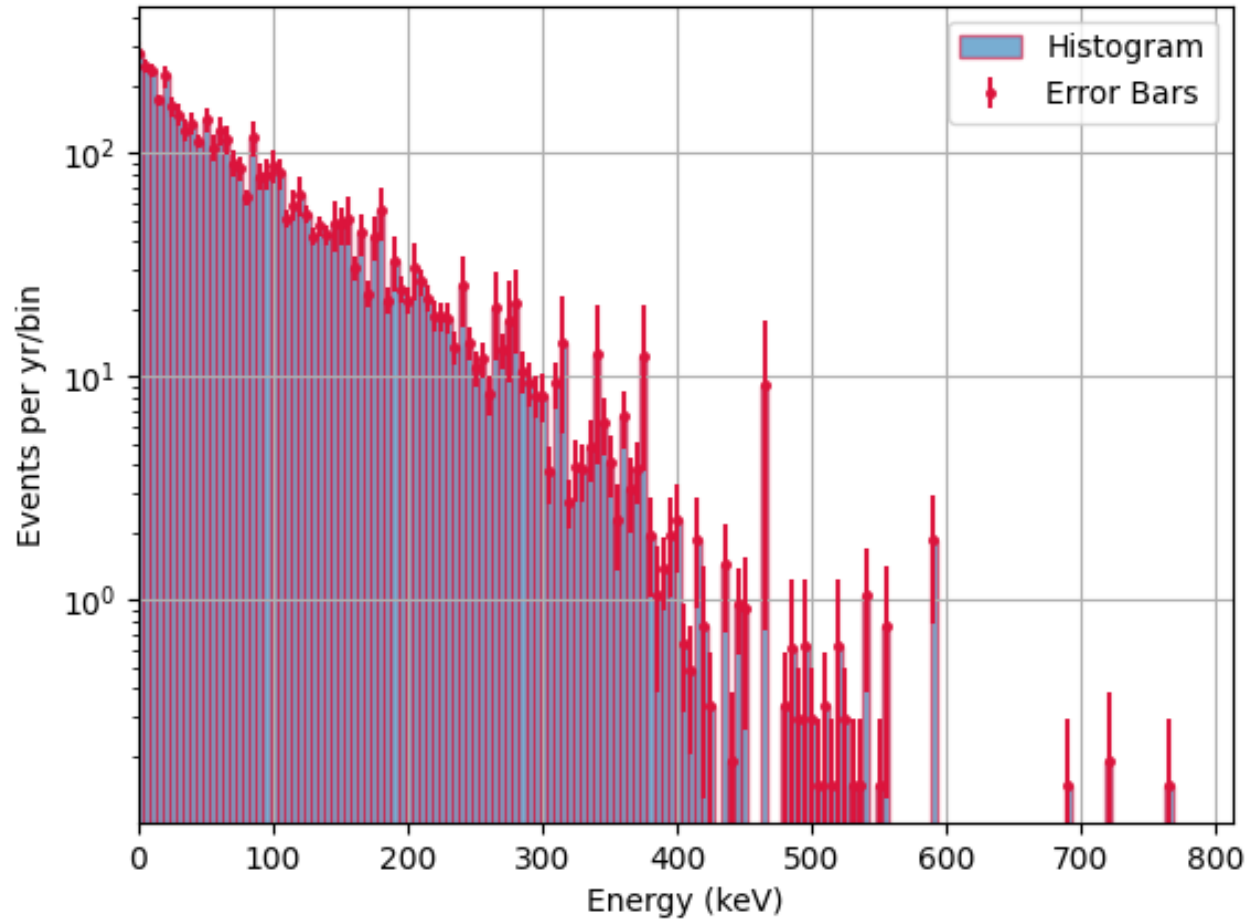
$$(1.46 \pm 0.04) \times 10^4$$

evt per year

Full energy range [0,3000] keV

$$(5.92 \pm 0.07) \times 10^4$$

evt per year



## Key event rates

Low energy range [1,20] keV

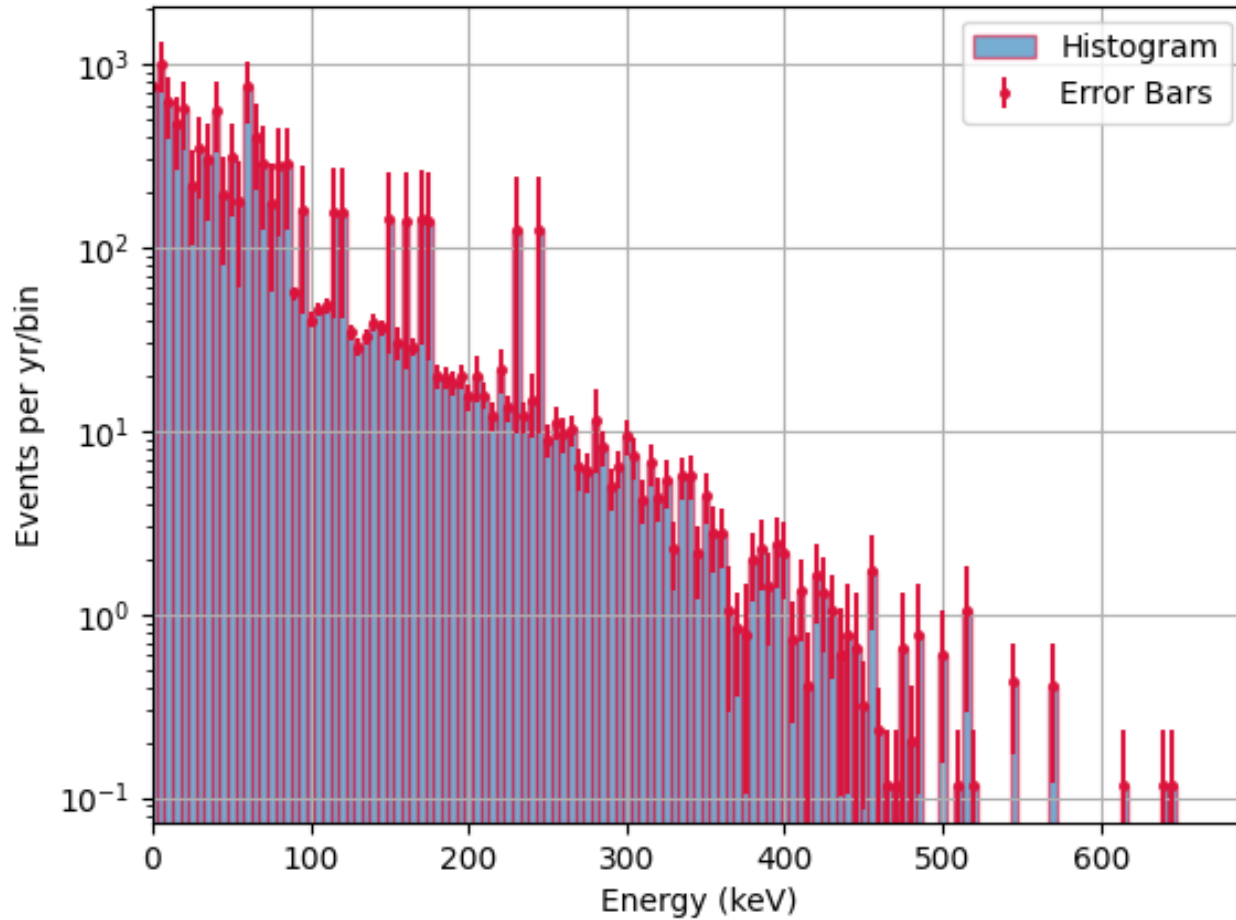
$$(4.52 \pm 0.18) \times 10^3$$

evt per year

Full energy range [0,3000] keV

$$(2.08 \pm 0.04) \times 10^4$$

evt per year



## Key event rates

Low energy range [1,20] keV

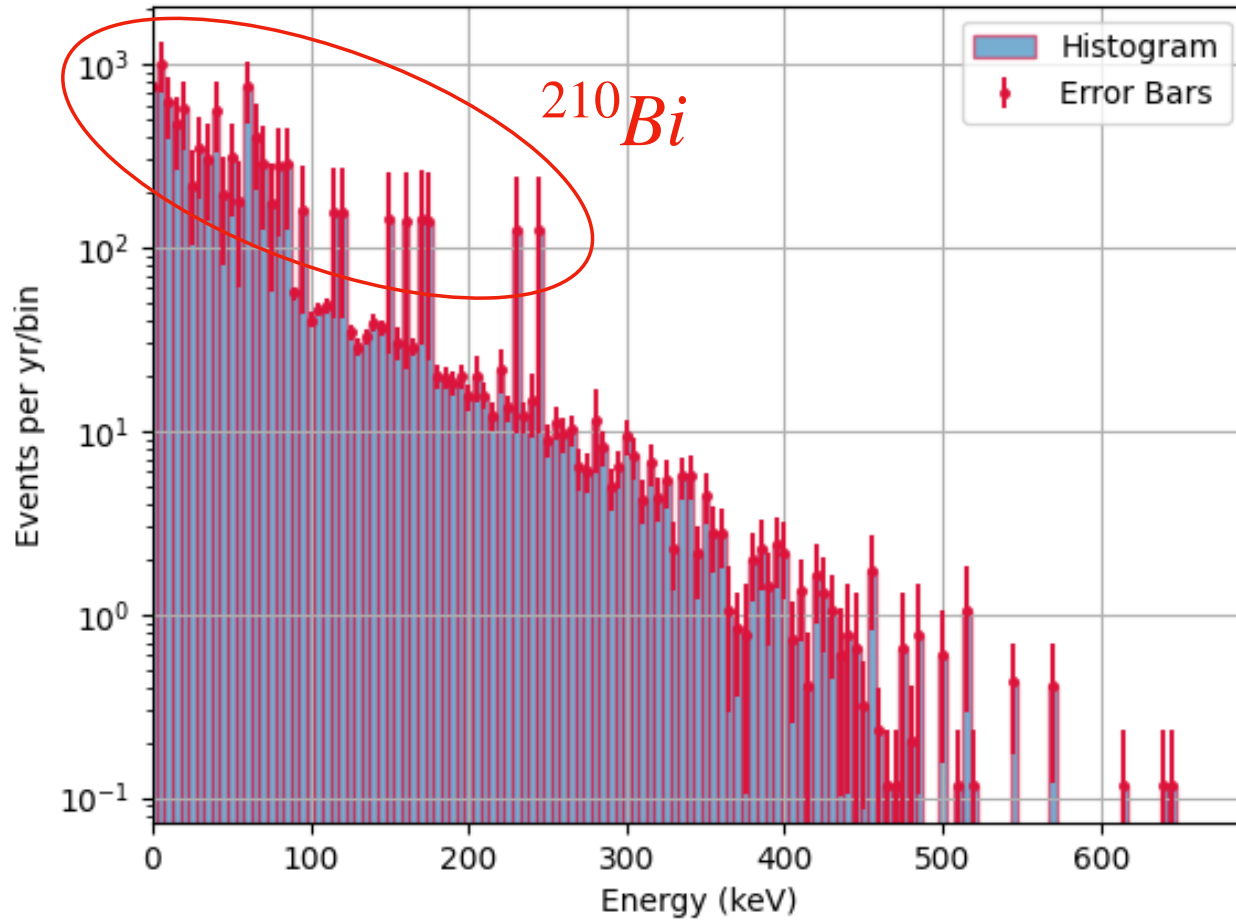
$$(1.06 \pm 0.27) \times 10^4$$

evt per year

$^{210}\text{Bi}$  statistics

$$8 \times 10^8$$

evt simulated in Geant4



## Key event rates

Low energy range [1,20] keV

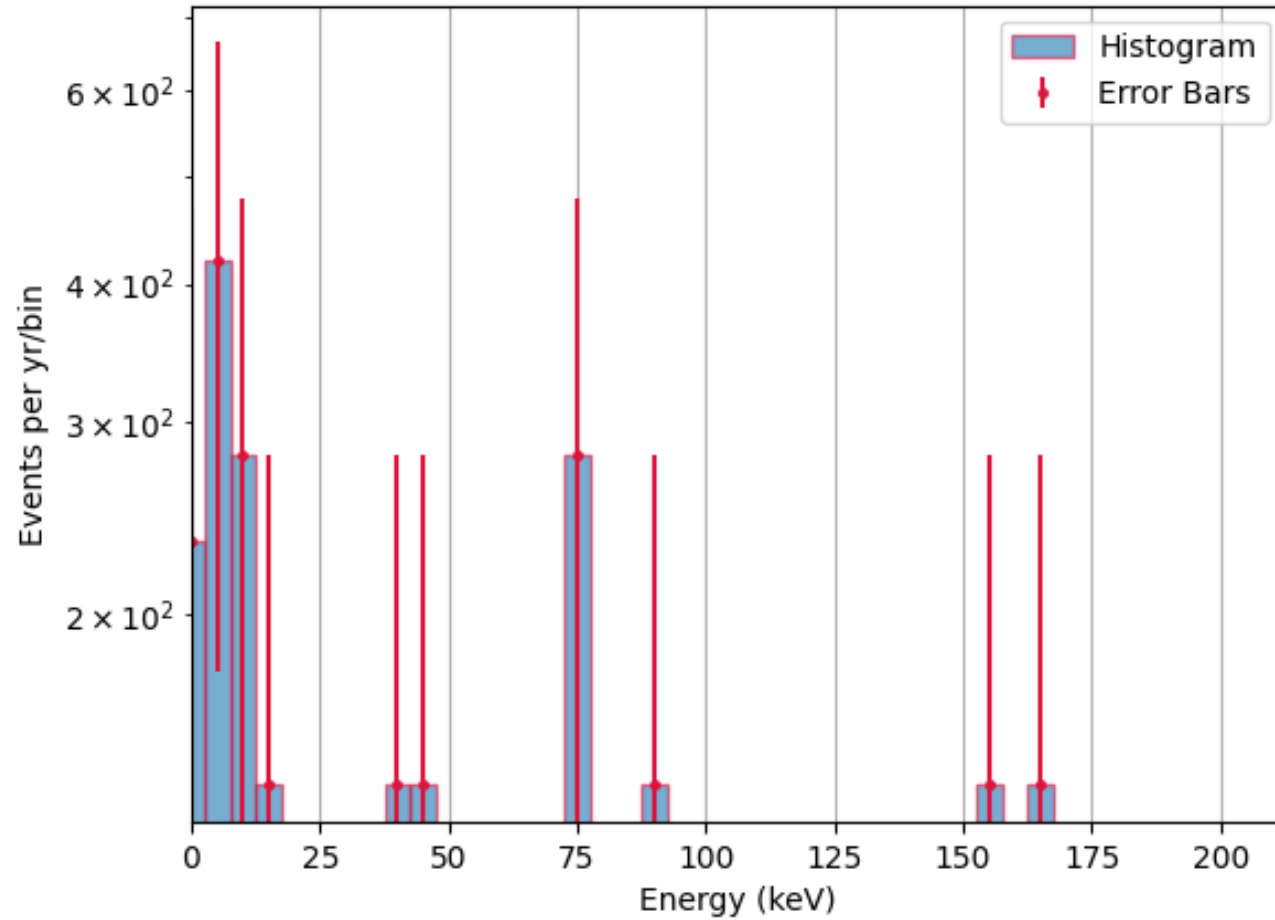
$$(1.06 \pm 0.27) \times 10^4$$

evt per year

$^{210}\text{Bi}$  statistics

$$8 \times 10^8$$

evt simulated in Geant4

$^{210}\text{Bi}$ 

## Key event rates

Low energy range [1,20] keV

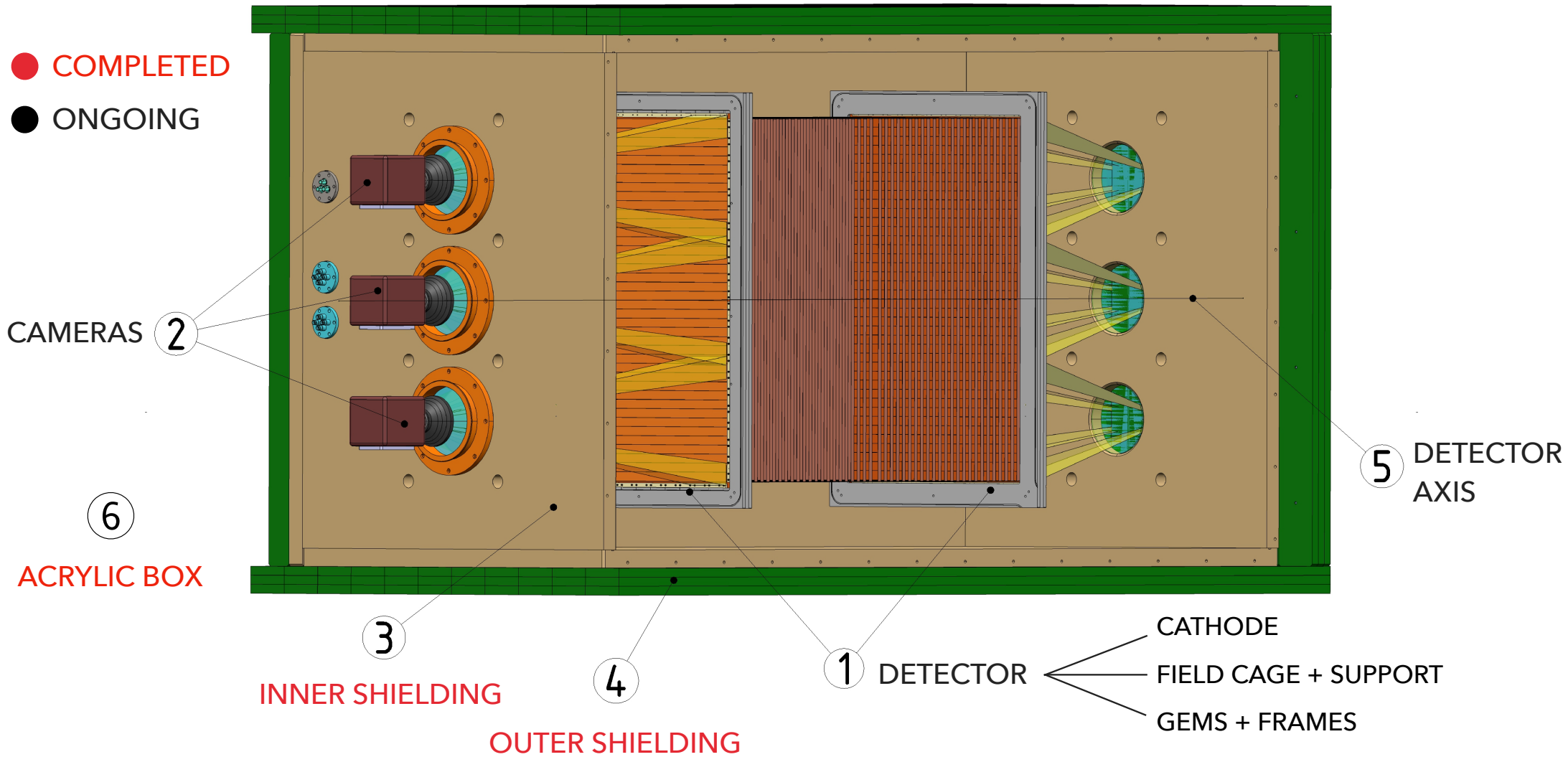
$$(4.90 \pm 1.85) \times 10^3$$

evt per year

$^{210}\text{Bi}$  statistics

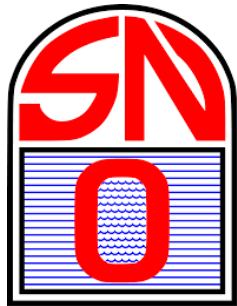
$$7 \times 10^8$$

evt simulated in Geant4



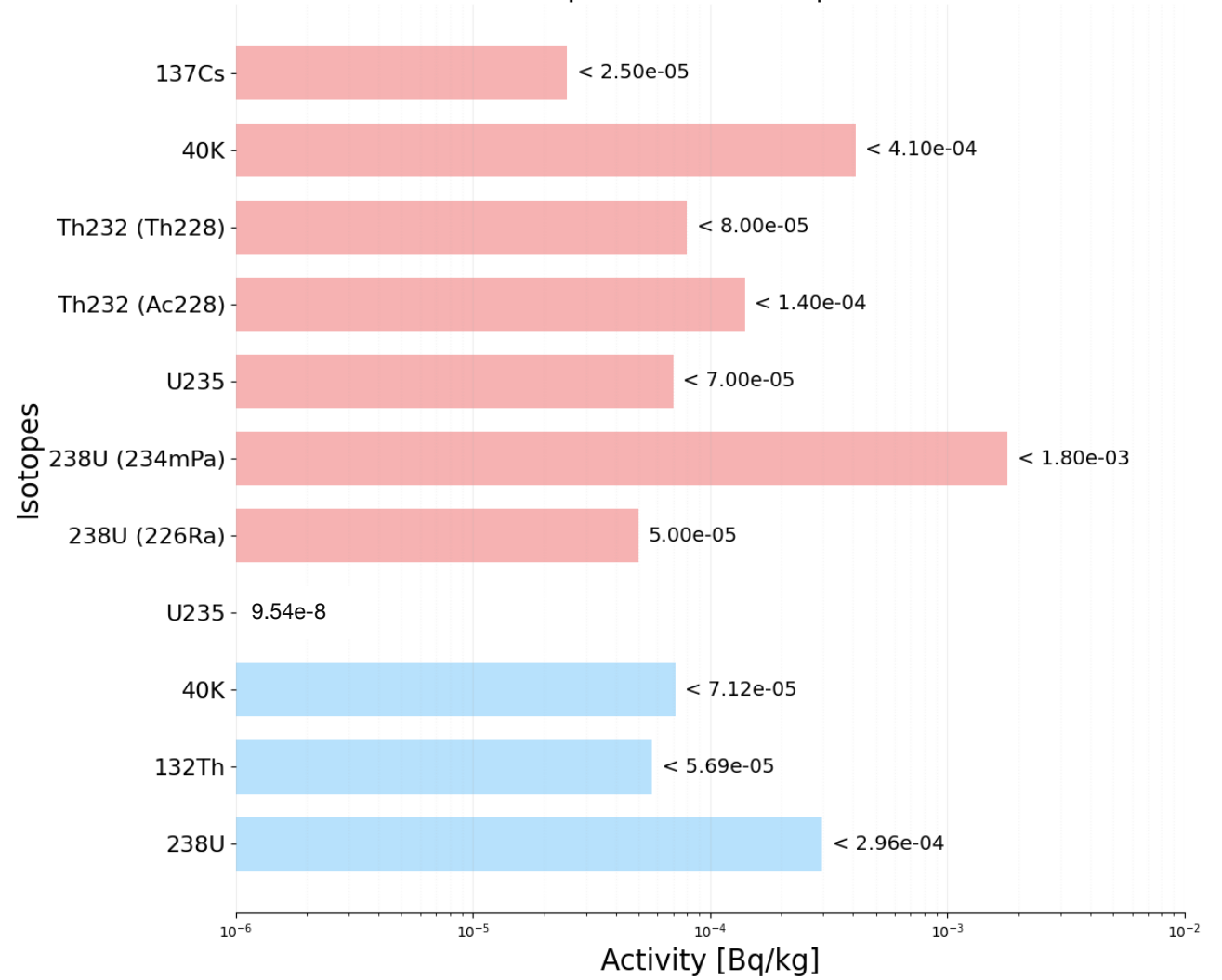


 DONCHAMP ACRYLIC

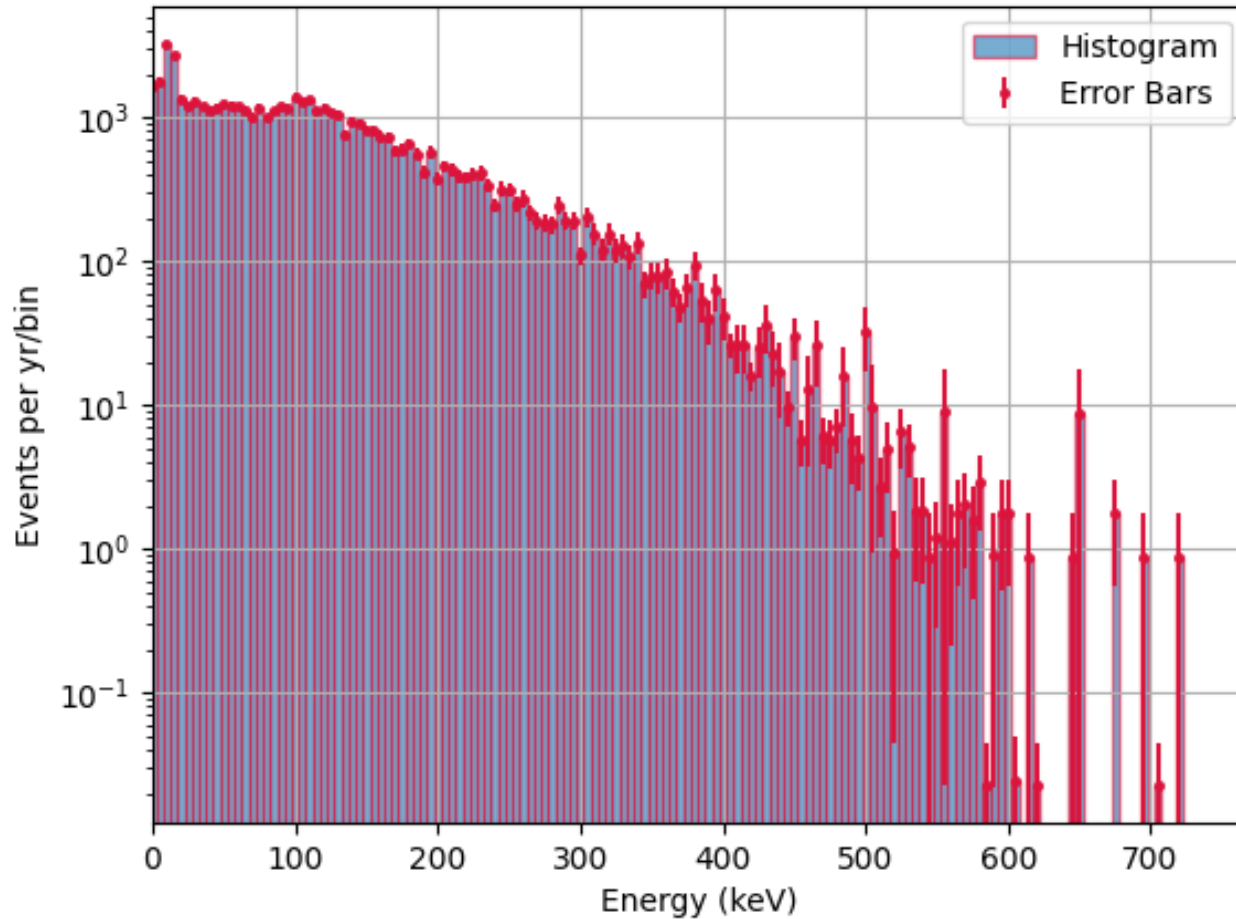


 SNO ACRYLIC

Isotope Activities Comparison







## Key event rates

Low energy range [1,20] keV

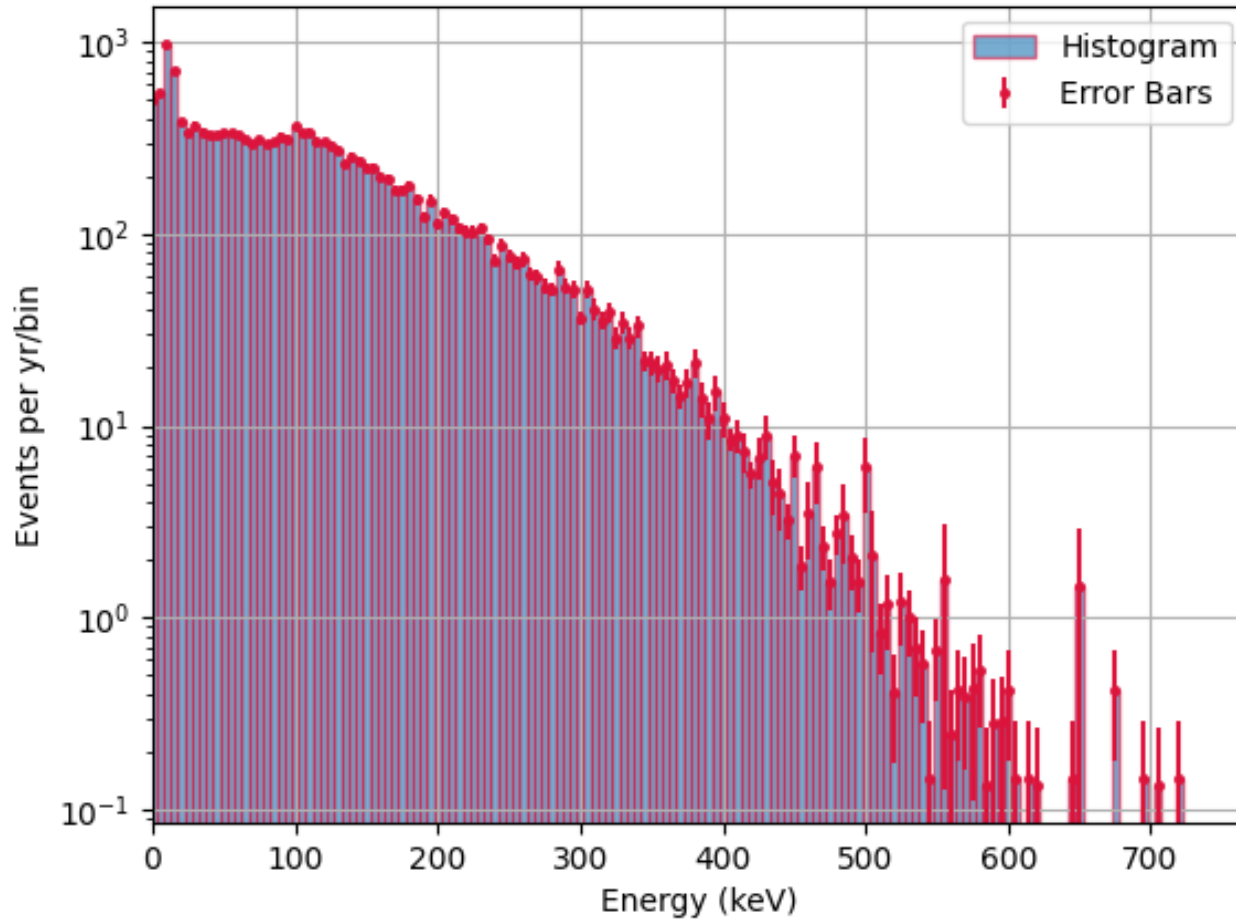
$$(4.55 \pm 0.10) \times 10^4$$

evt per year

Full energy range [0,3000] keV

$$(2.66 \pm 0.02) \times 10^5$$

evt per year



## Key event rates

Low energy range [1,20] keV

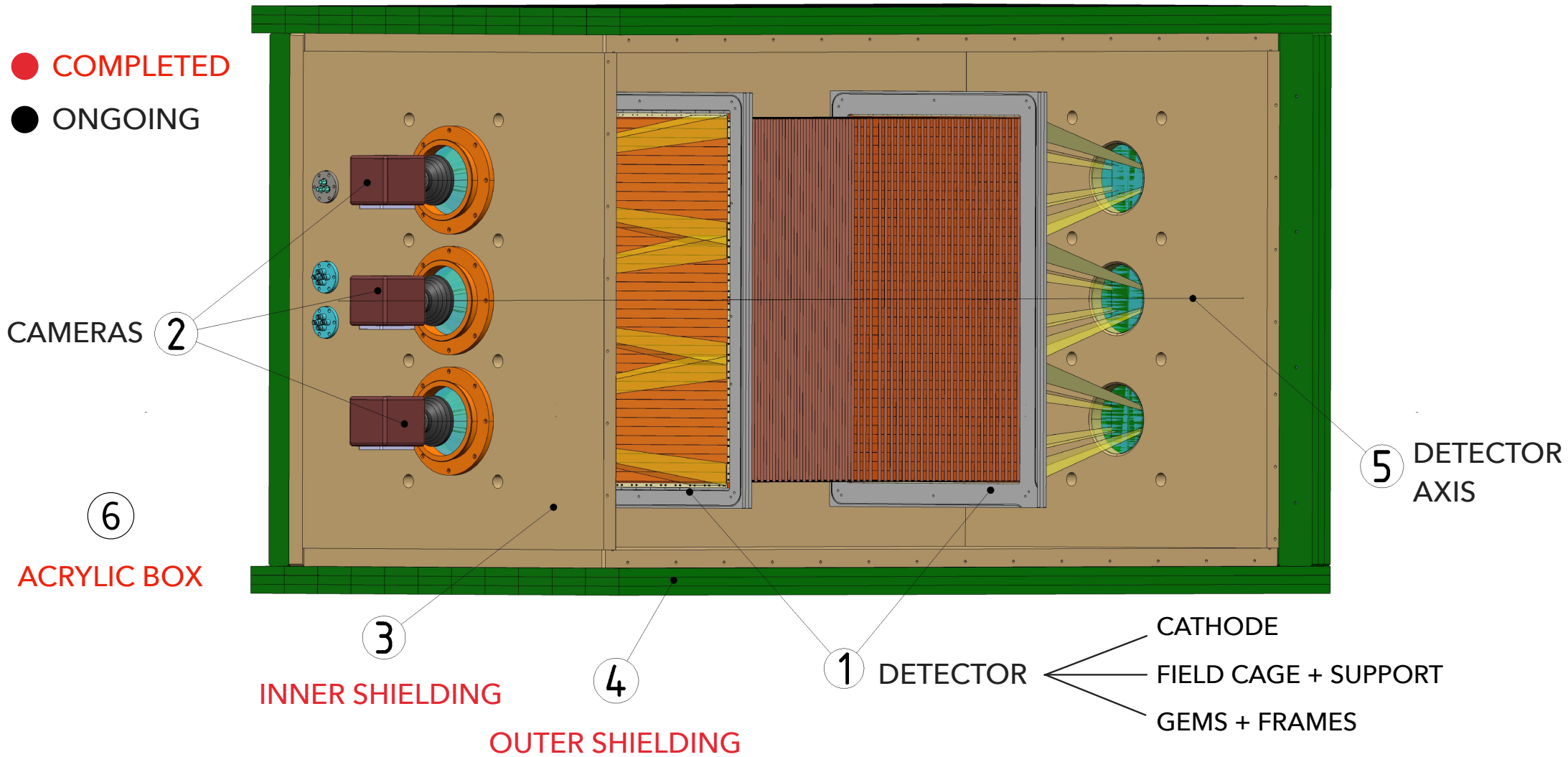
$$(1.33 \pm 0.02) \times 10^4$$

evt per year

Full energy range [0,3000] keV

$$(7.40 \pm 0.04) \times 10^4$$

evt per year



<b>Component</b>	<b>Rate 1-20 keV [evt/yr]</b>
<b>CuLayer_0</b>	<b><math>(1.46 \pm 0.04) \times 10^4</math></b>
<b>CuLayer_1</b>	<b><math>(4.52 \pm 0.18) \times 10^3</math></b>
<b>CuLayer_2</b>	<b><math>(1.06 \pm 0.27) \times 10^4</math></b>
<b>CuLayer_3</b>	<b><math>(4.90 \pm 1.85) \times 10^3</math></b>
<b>LNGS Acrylic box</b>	<b><math>(4.55 \pm 0.10) \times 10^4</math></b>
<b>SNO Acrylic box</b>	<b><math>(1.33 \pm 0.02) \times 10^4</math></b>