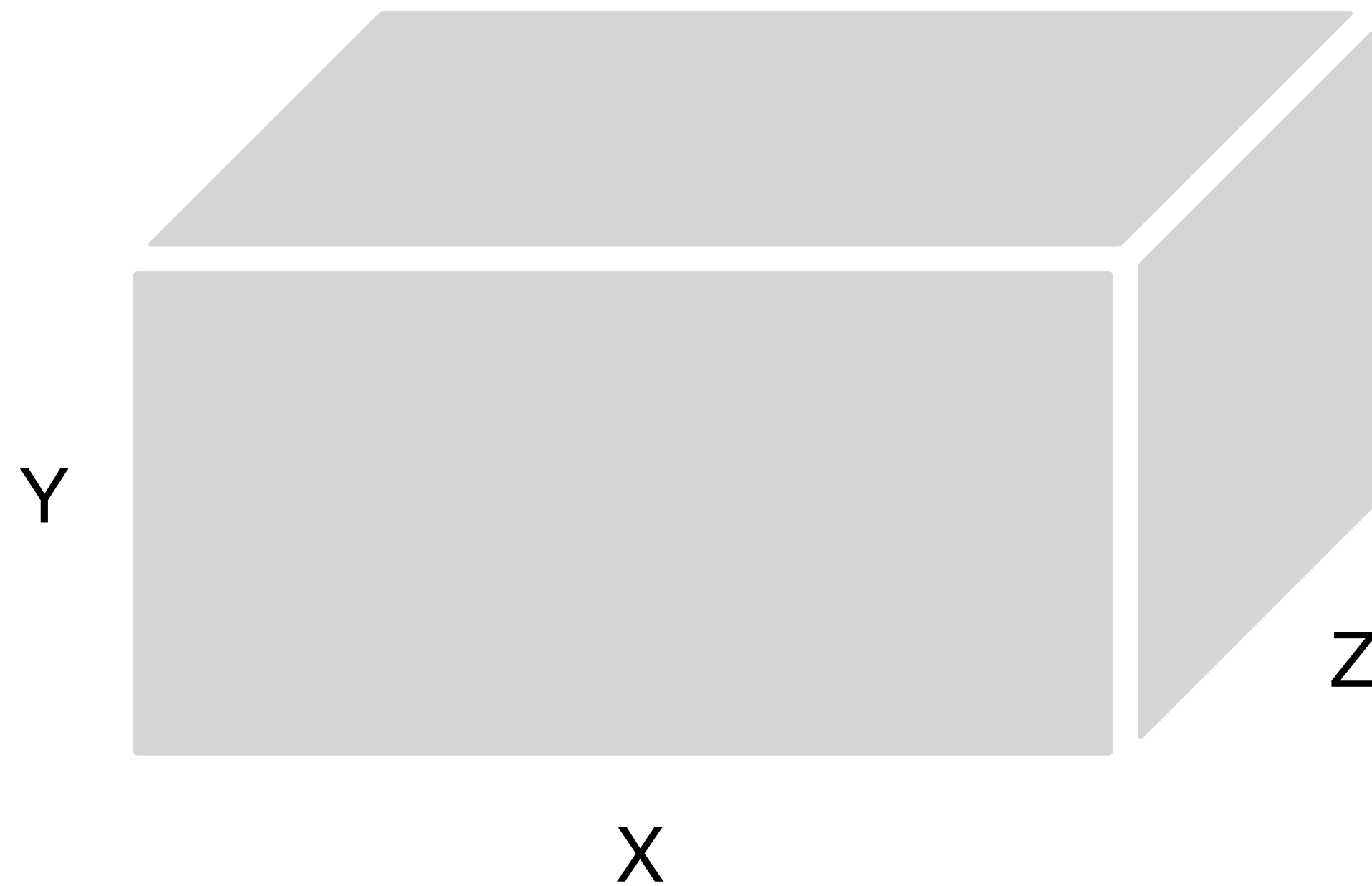


# Internal background status

Simulation meeting

Melba D'Astolfo, 1/07/2024

# Acrylic box - dimensions



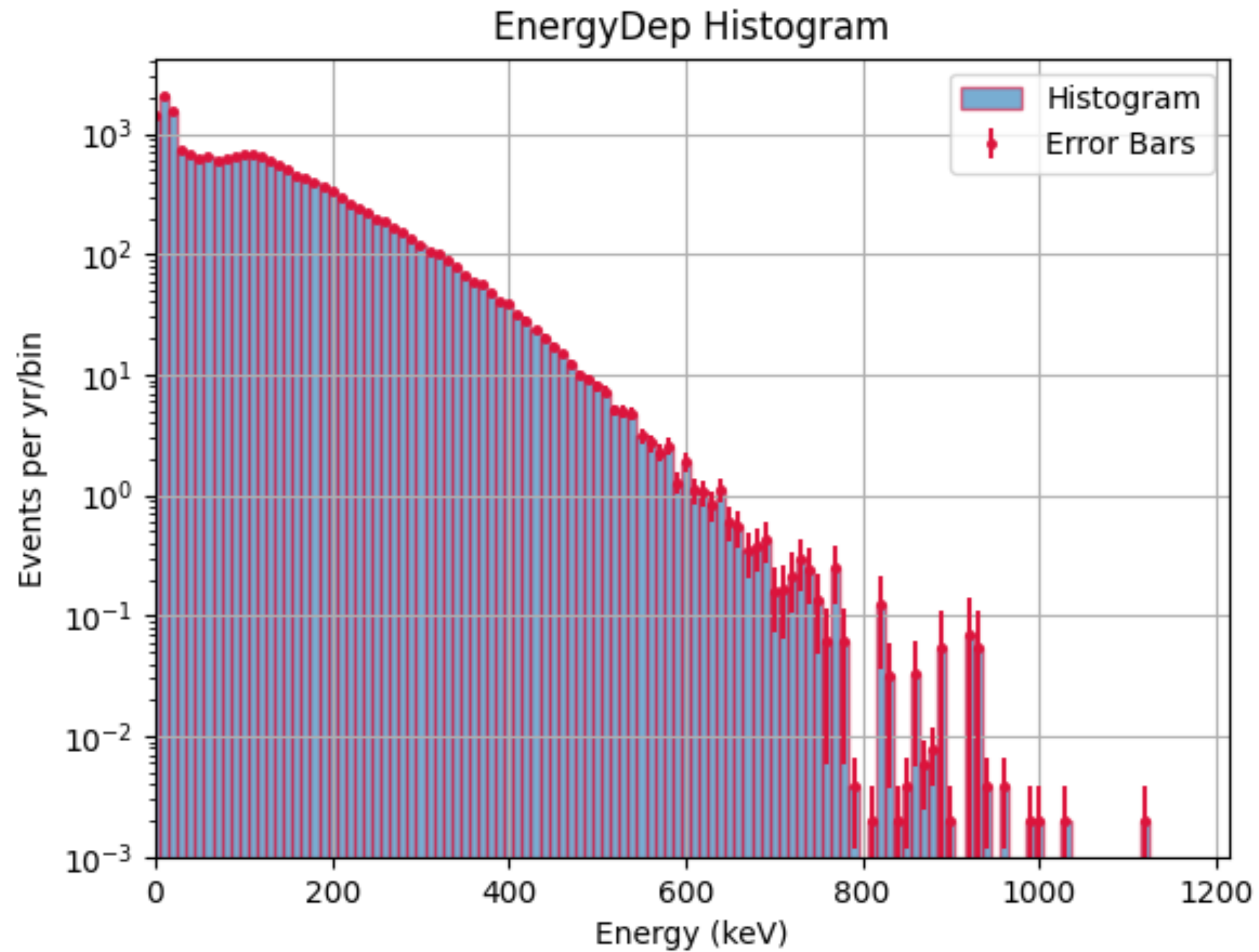
X = 1164 mm

Y = 1000 mm - a bit less than TDR to avoid overlaps

Z = 735 mm

Thickness = 20 mm

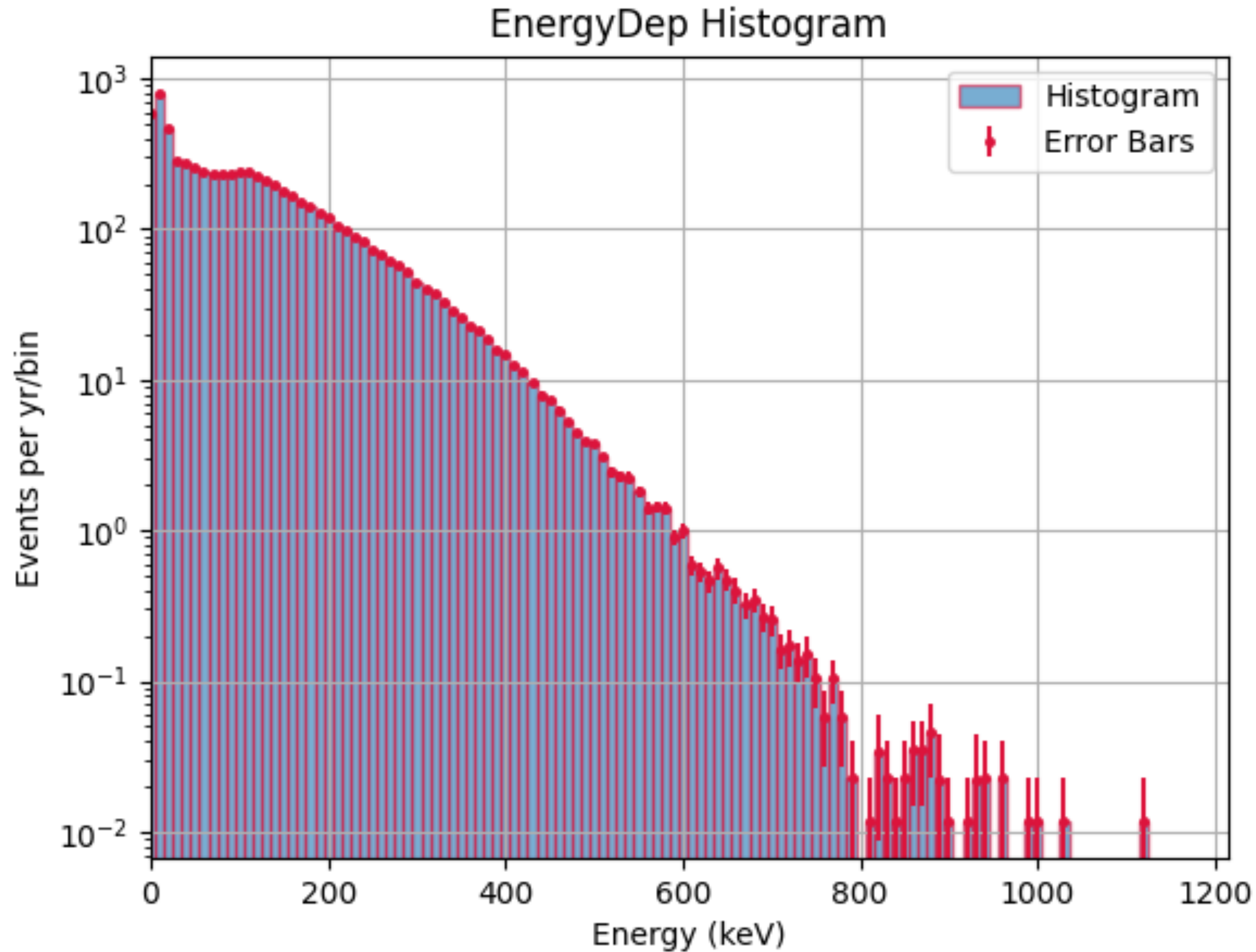
# Acrylic box - LNGS reference



ISOTOPE	ACTIVITY [Bq/kg]
$^{238}\text{U}_{top}$	1.80E-03
$^{238}\text{U}_{bottom}$	5.00E-05
$^{235}\text{U}$	7.00E-05
$^{232}\text{Th}$	1.40E-04
$^{40}\text{K}$	4.00E-04
$^{137}\text{Cs}$	2.50E-05

Total Rate for events within the energy interval [1, 20] keV from all detectors:  $38376 \pm 156$  events per year

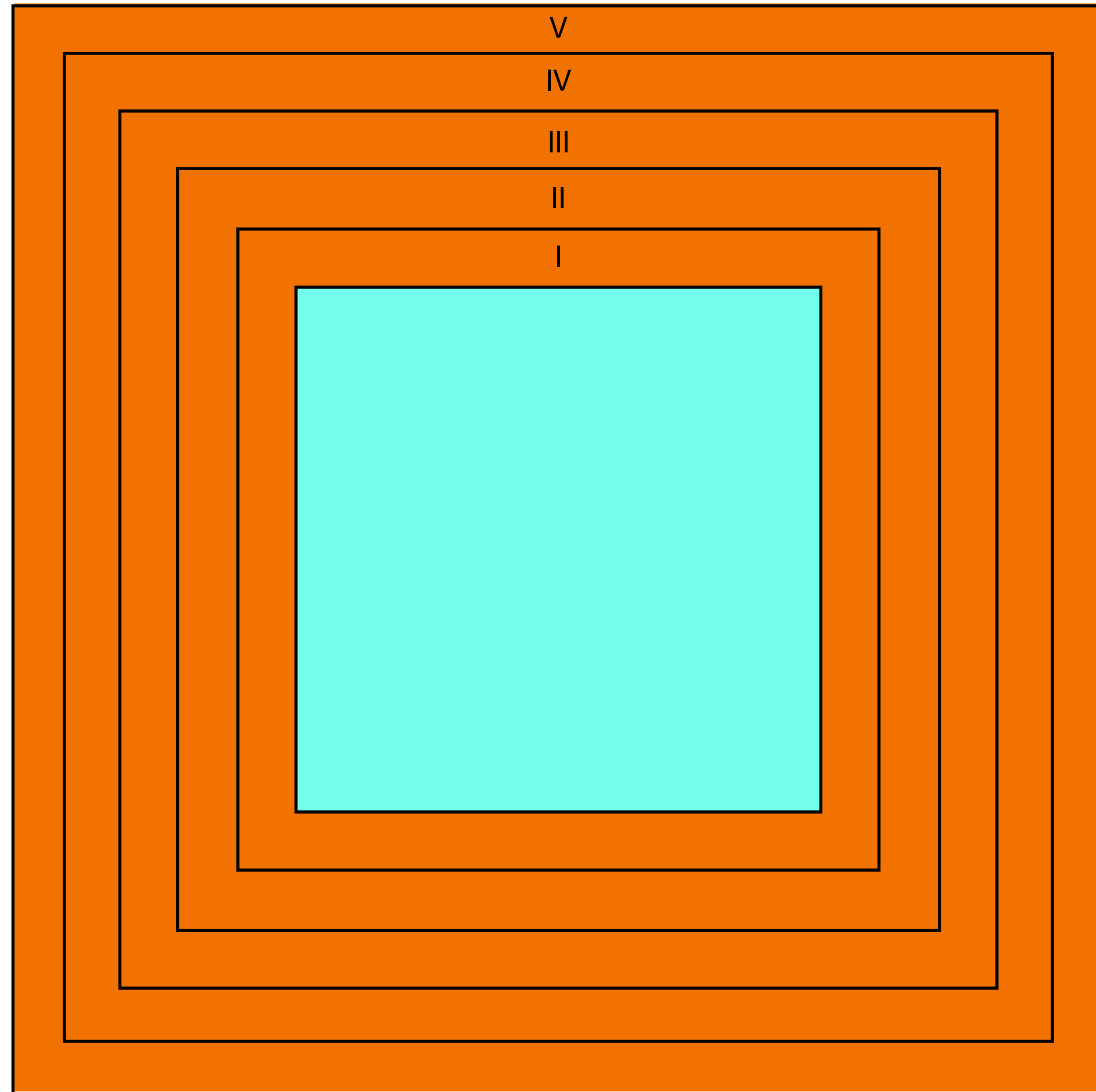
# Acrylic box - SNO reference



ISOTOPE	ACTIVITY [Bq/kg]
$^{238}\text{U}$	2.96E-04
$^{232}\text{Th}$	5.69E-05
$^{40}\text{K}$	7.12E-05

Total Rate for events within the energy interval [1, 20] keV from all detectors:  $13701 \pm 43$  events per year

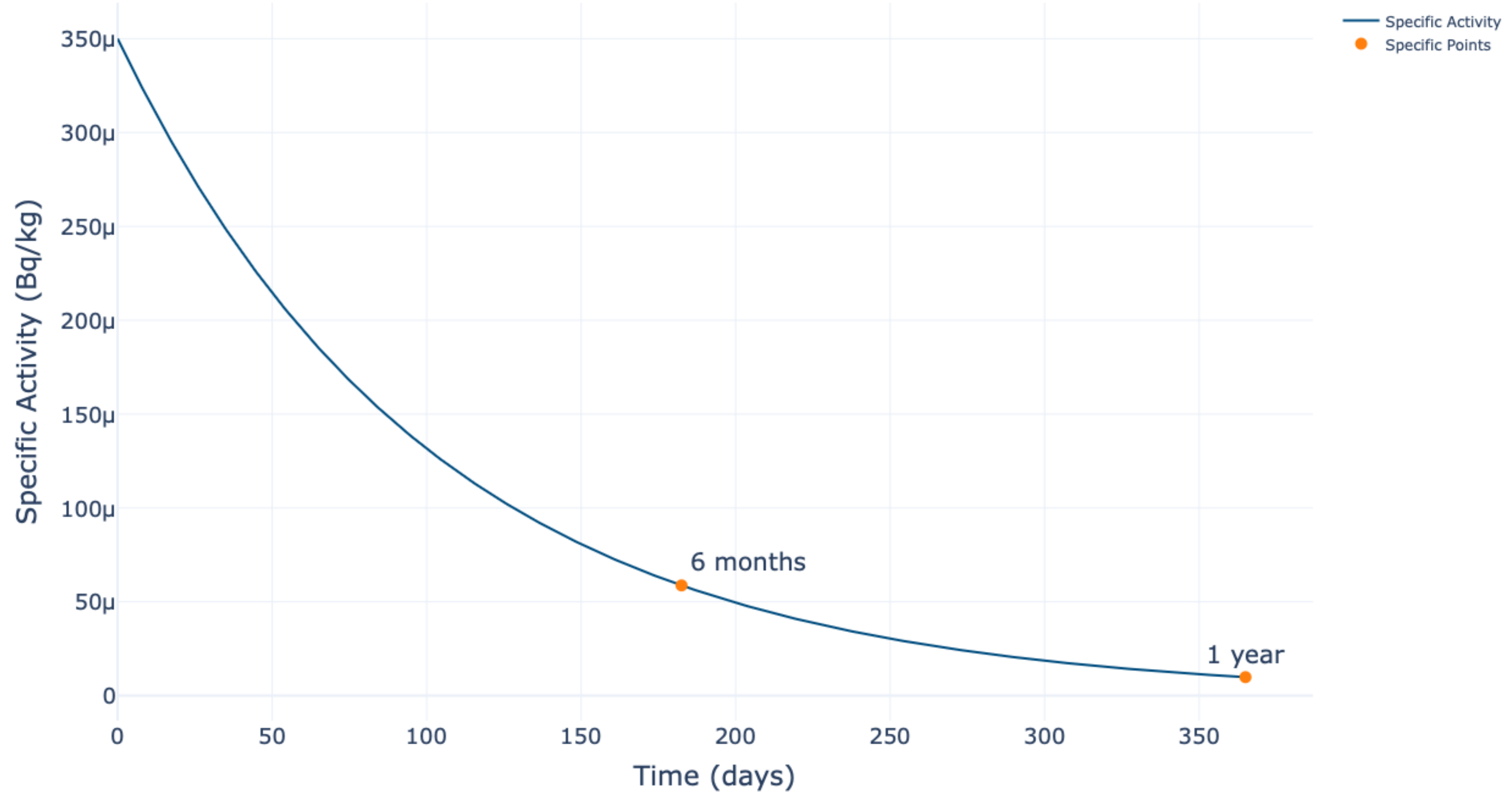
# Layer configuration



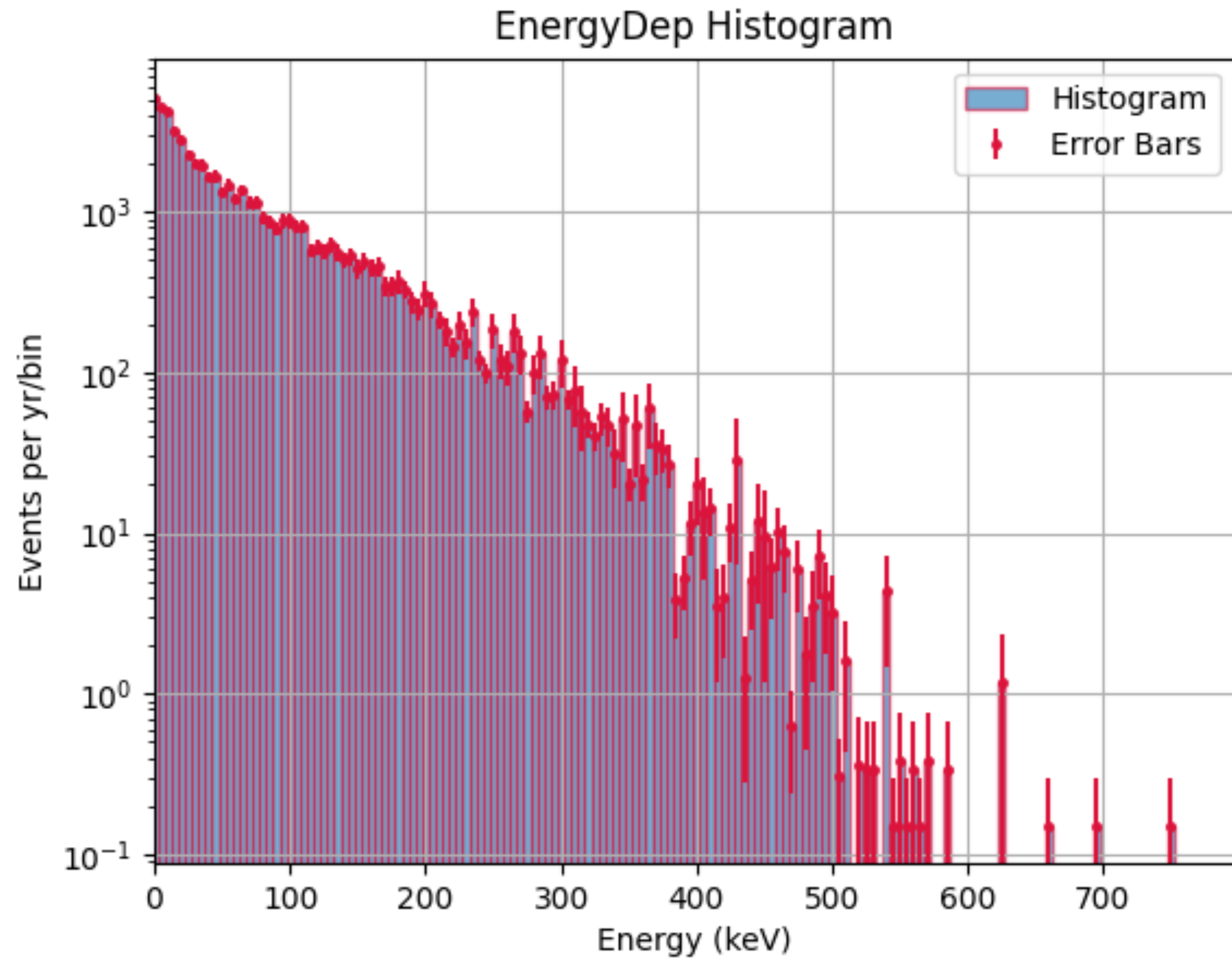
- I. SCHRIEBER
- II. SCHRIEBER
- III. OPERA
- IV. OPERA
- V. OPERA

# Activity vs time

Specific Activity Trend of Co-58 Over Time

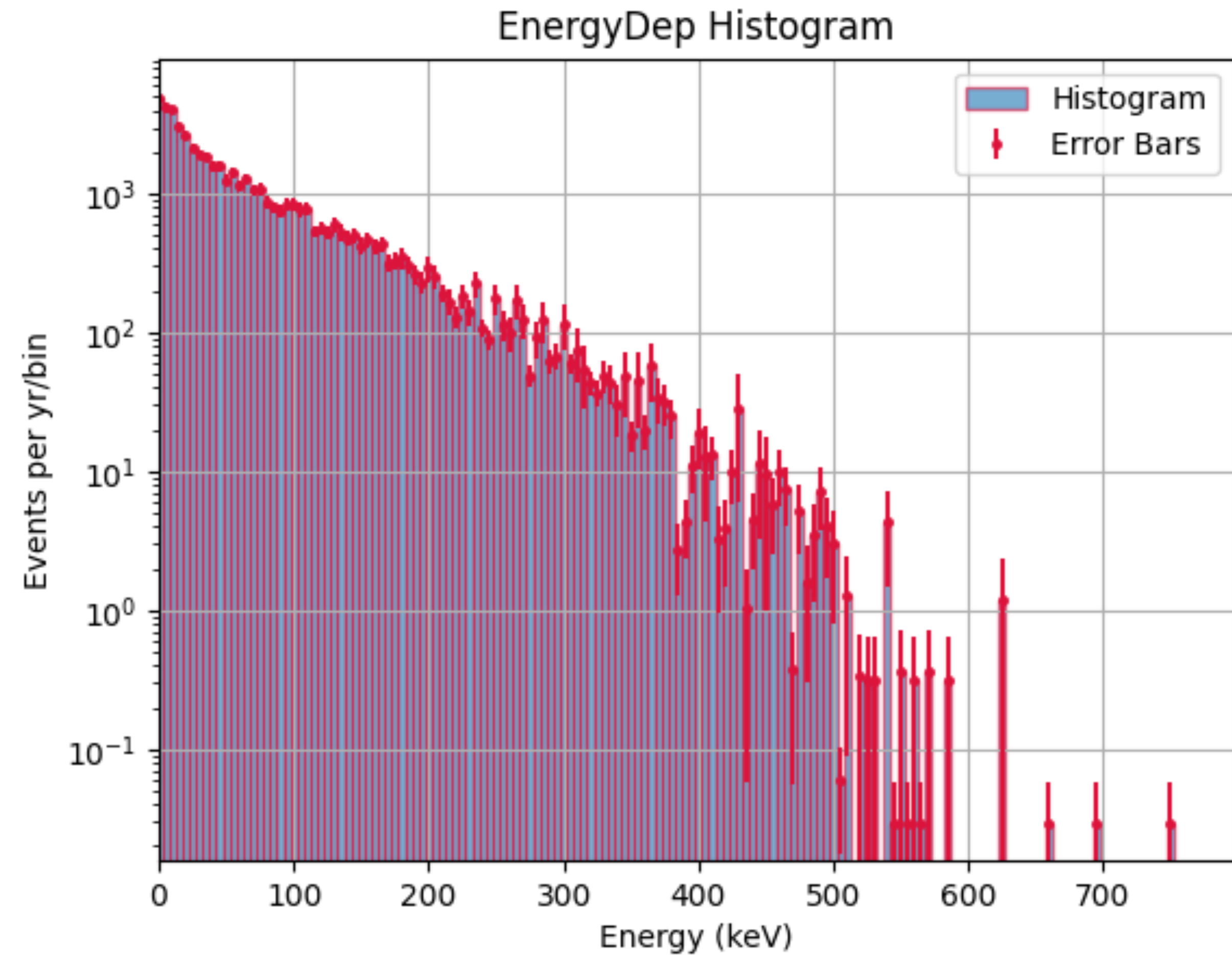


# Shielding contribution (6 months)



	<b>0 [months]</b>	<b>6 [months]</b>
<b>Layer_0 [events per year]</b>	72695 ± 1941	59638 ± 1878
<b>Layer_1 [events per year]</b>	15772 ± 795	11849 ± 750
<b>Layer_2 [events per year]</b>	4711 ± 344	4676 ± 342
<b>Layer_3 [events per year]</b>	2278 ± 244	2259 ± 242
<b>Layer_4 [events per year]</b>	967 ± 165	960 ± 164
<b>TOTAL</b>	<b>96423 ± 2145</b>	<b>79381 ± 2072</b>

# Shielding contribution (1 year)



	<b>0</b> <b>[months]</b>	<b>12</b> <b>[months]</b>
<b>Layer_0</b> <b>[events per year]</b>	$72695 \pm 1941$	$56791 \pm 1874$
<b>Layer_1</b> <b>[events per year]</b>	$15772 \pm 795$	$11082 \pm 749$
<b>Layer_2</b> <b>[events per year]</b>	$4711 \pm 344$	$4641 \pm 339$
<b>Layer_3</b> <b>[events per year]</b>	$2278 \pm 244$	$2242 \pm 240$
<b>Layer_4</b> <b>[events per year]</b>	$967 \pm 165$	$952 \pm 163$
<b>TOTAL</b>	$96423 \pm 2145$	$75708 \pm 2067$