INTERNAL BACKGROUND ANALYSIS

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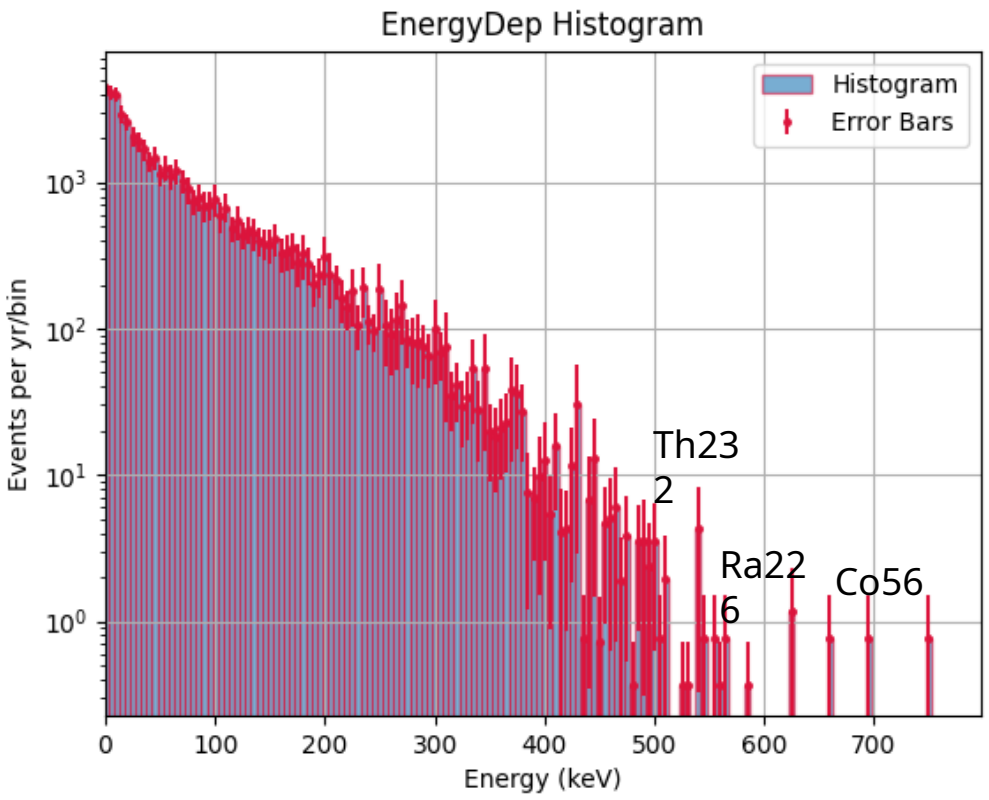
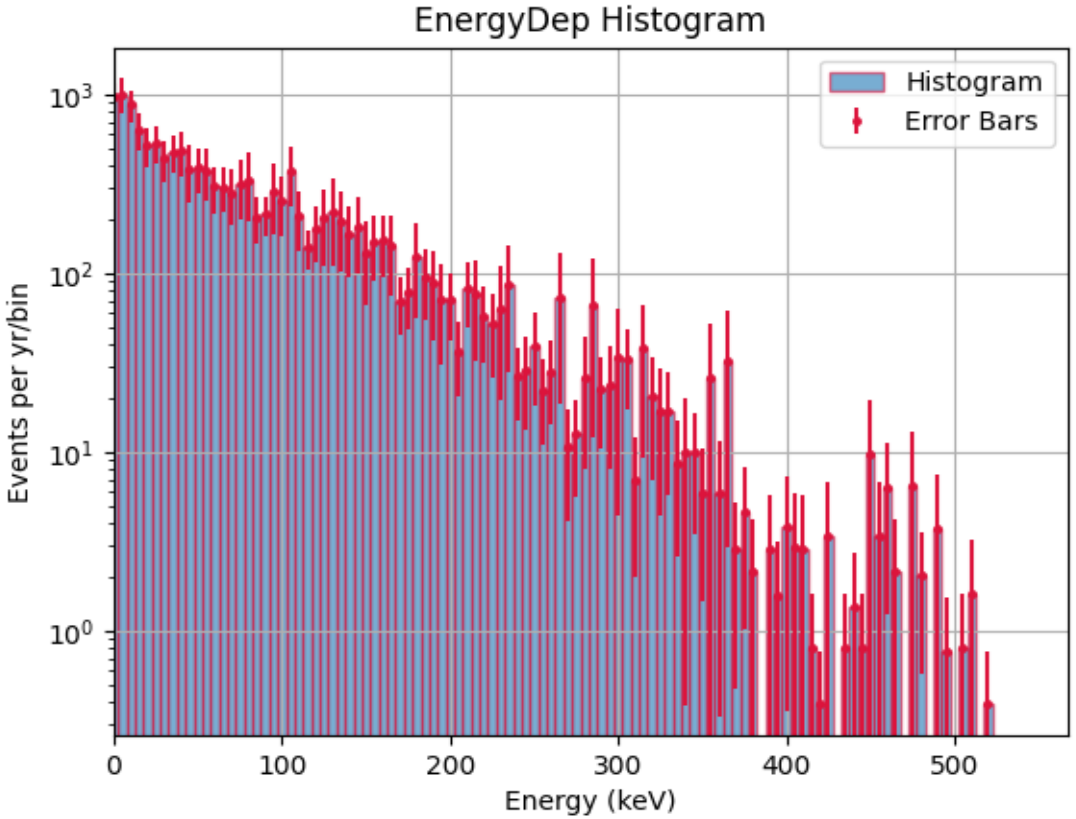
Layer_0 and Layer_1 Simulation for **Schrieber-SABRE**

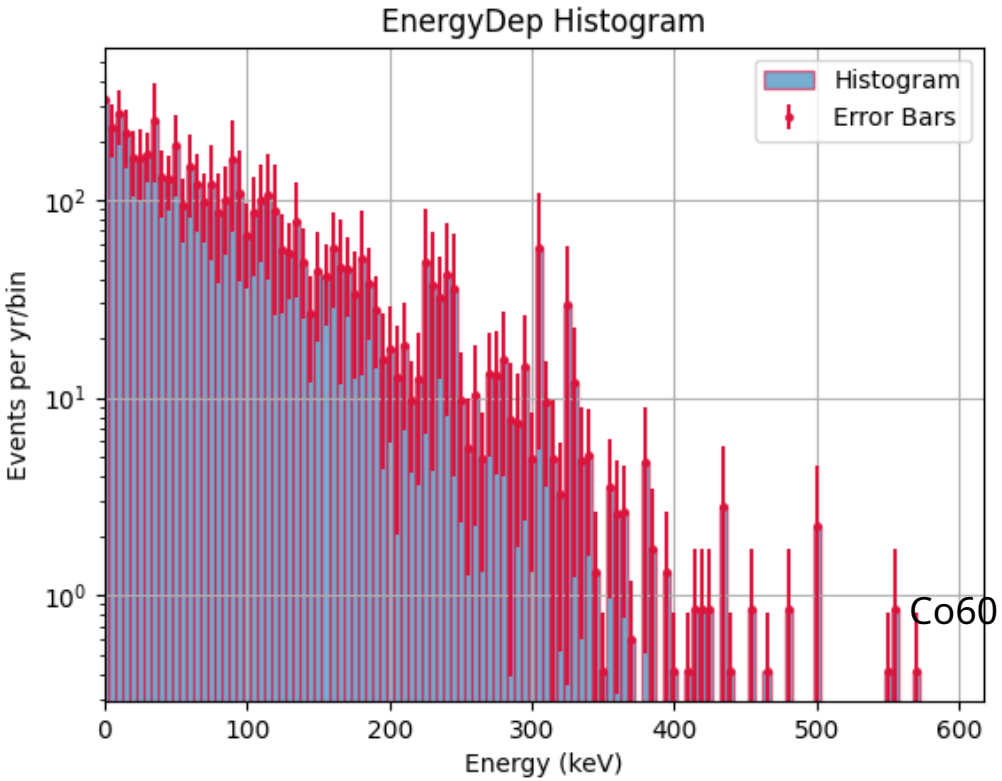


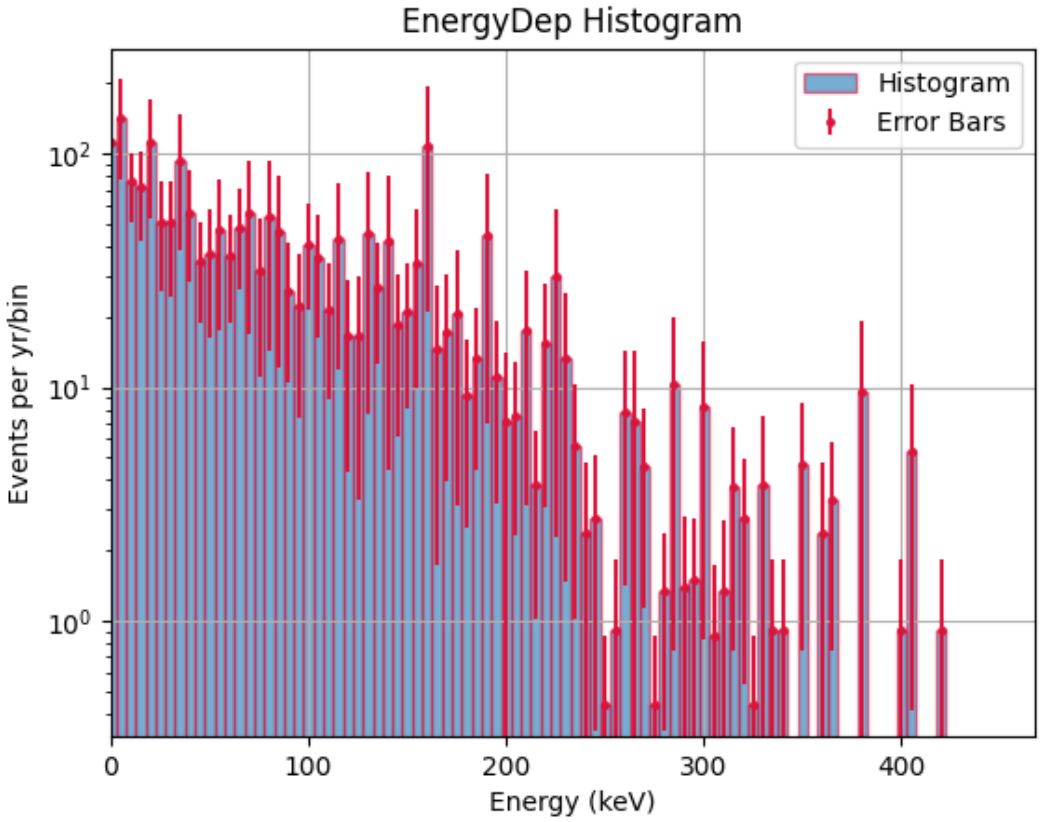


CuLayer_0: 72694.86 ± 1940.51 events per year.
'**U238**' : 28773.93 ± 1787.92 events per year.

CuLayer_1: 15771.71 ± 794.61 events per year.
'**U238**' : 4021.60 ± 689.69 events per year.

Layer_2 and Layer_3 Simulation for **Schrieber-SABRE**

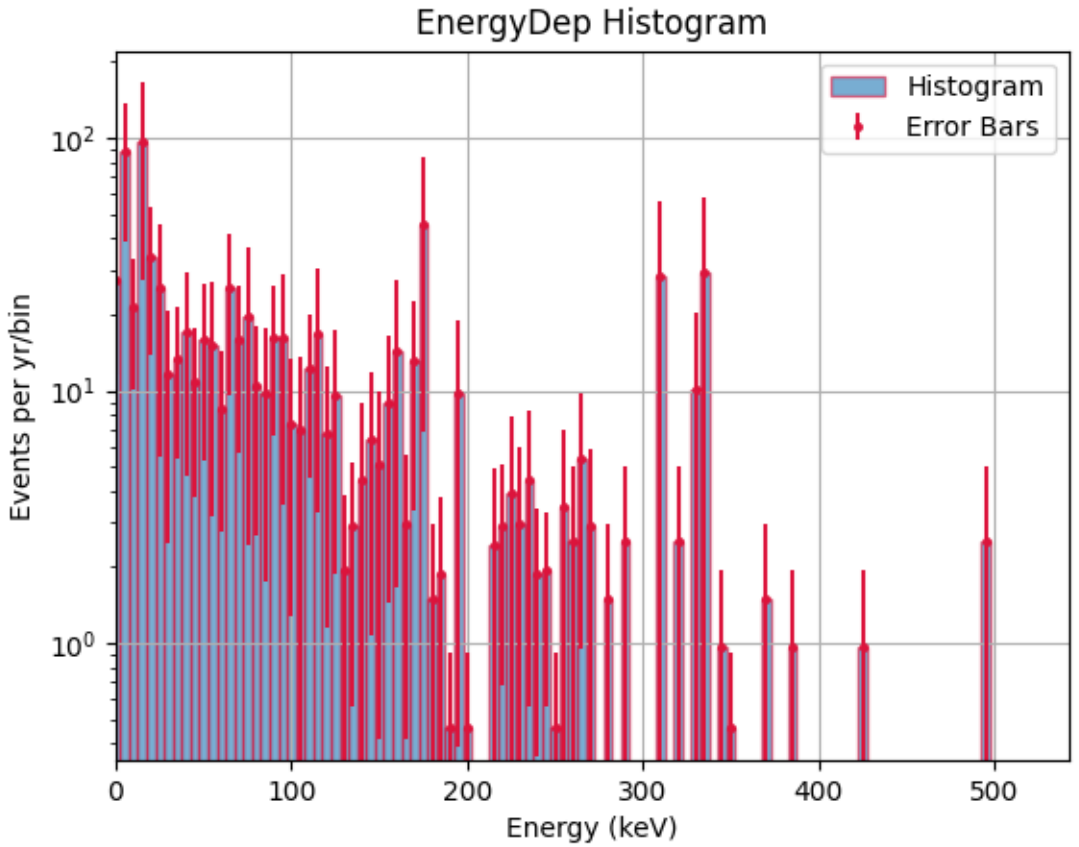




CuLayer_2: 4798.91 ± 396.09 events per year.
'**Co58**' : 1041.81 ± 155.30 events per year.

CuLayer_3: 1987.18 ± 219.24 events per year.
'**Th232**' : 429.29 ± 71.54 events per year.

Layer_4 Simulation for **Schrieber-SABRE**

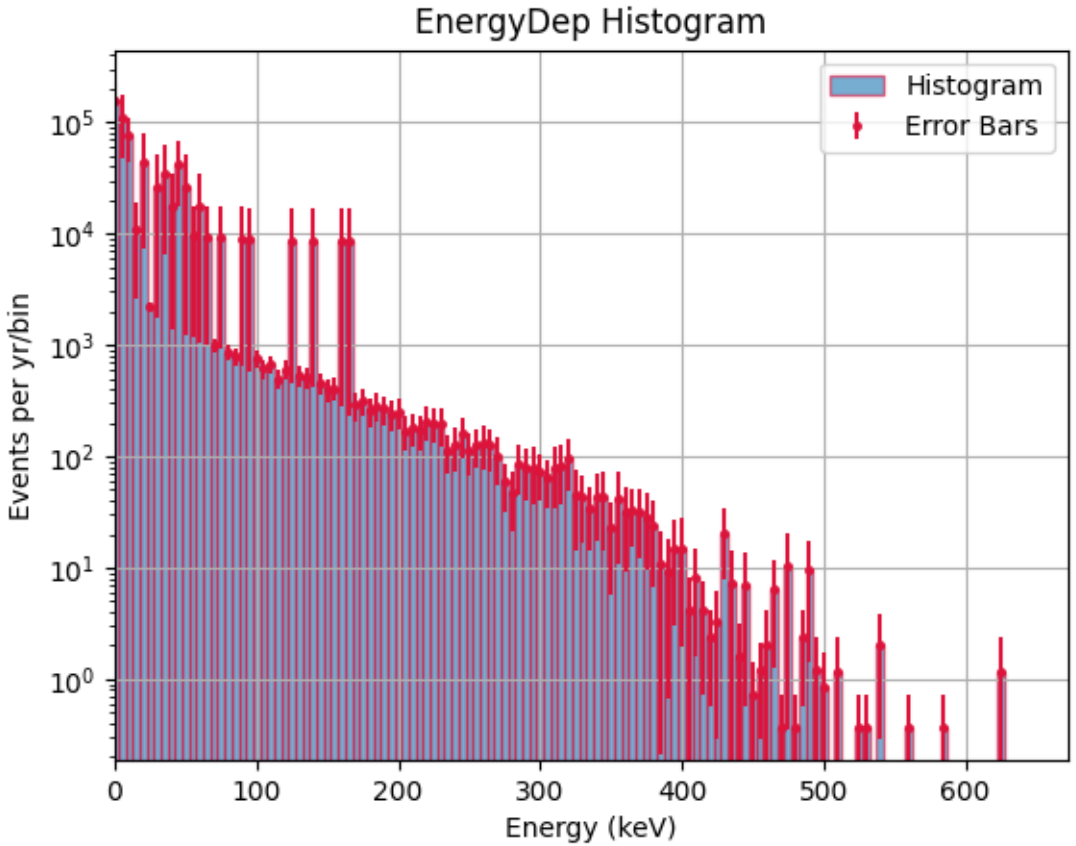


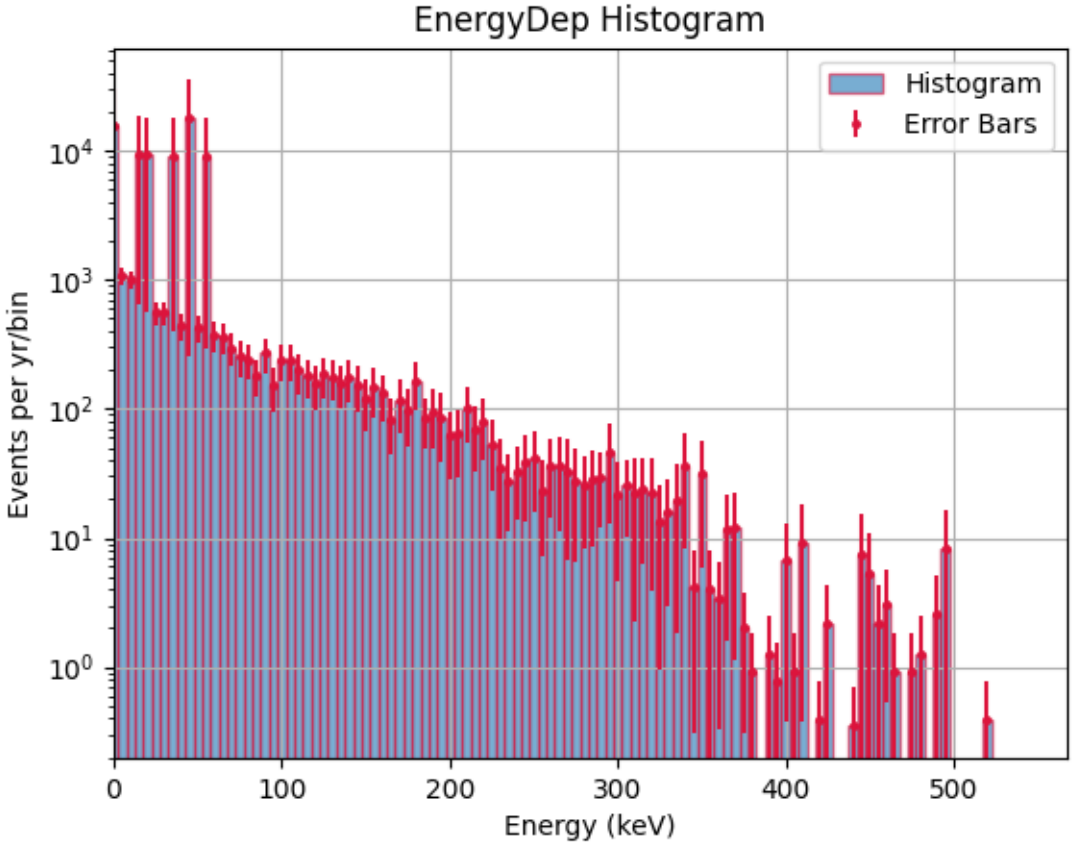
Layer No	Old (event per year)	New (event per year)
Layer_0	239090.09 ± 14923.54	72694.86 ± 1940.51
Layer_1	10622.82 ± 1237.0	15771.71 ± 794.61
Layer_2	3152.17 ± 219.92	4798.91 ± 396.09
Layer_3	1345.34 ± 137.93	1987.18 ± 219.24
Layer_4	1966.69 ± 1413.88	1184.42 ± 266.23

Comparison between previous & new simulation

CuLayer_4: 1184.42 ± 266.23 events per year.
'**U238**' : 423.24 ± 244.36events per year.

Layer_0 and Layer_1 Simulation for **OPERA**

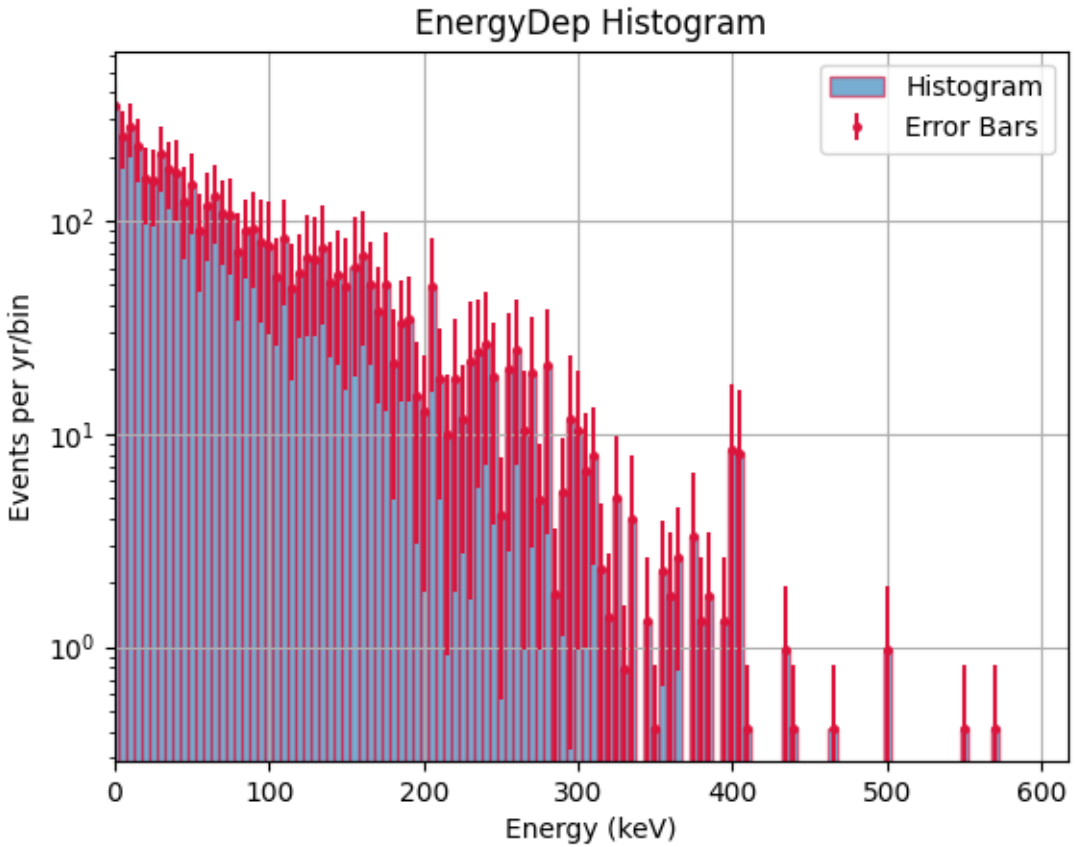


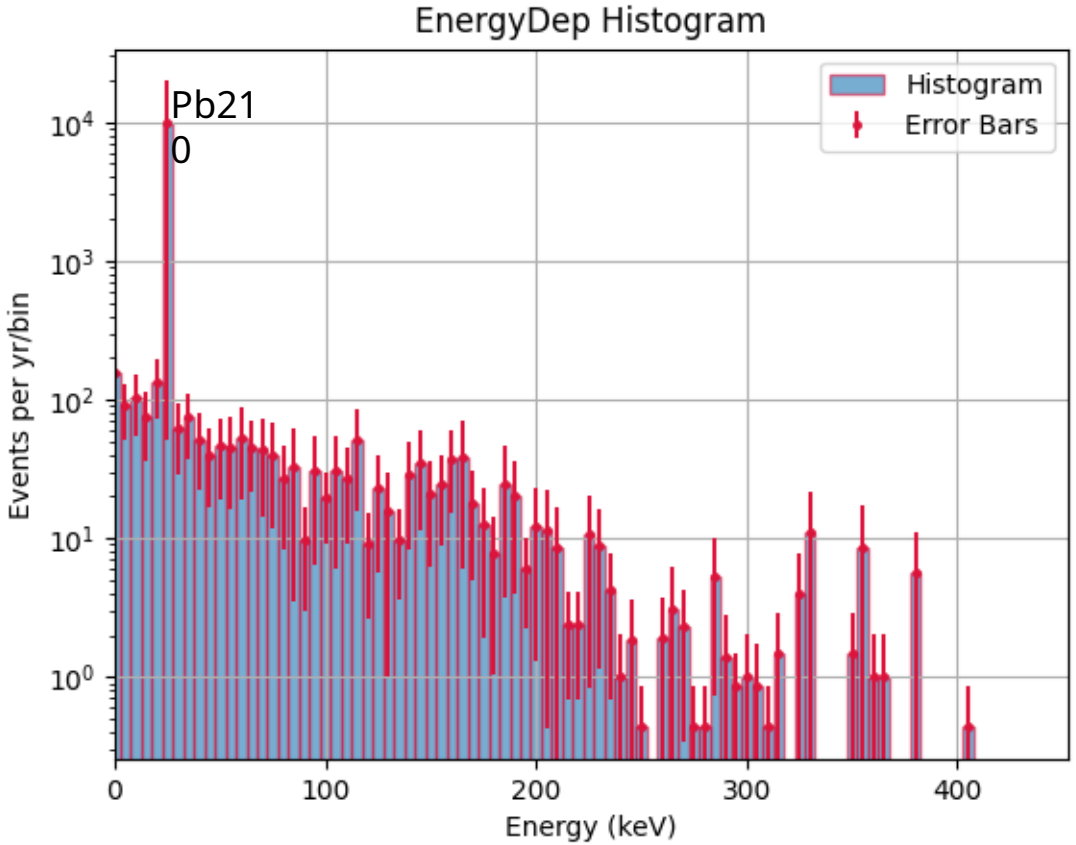


CuLayer_0: 1377564.09 ± 231539.81
events per year.
'**Pb210**' : 1309766.82 ± 231536.25
events per year.

CuLayer_1: 149202.82 ± 75482.00
events per year.
'**Pb210**' : 130733.20 ± 75478.85

Layer_2 and Layer_3 Simulation for **OPERA**

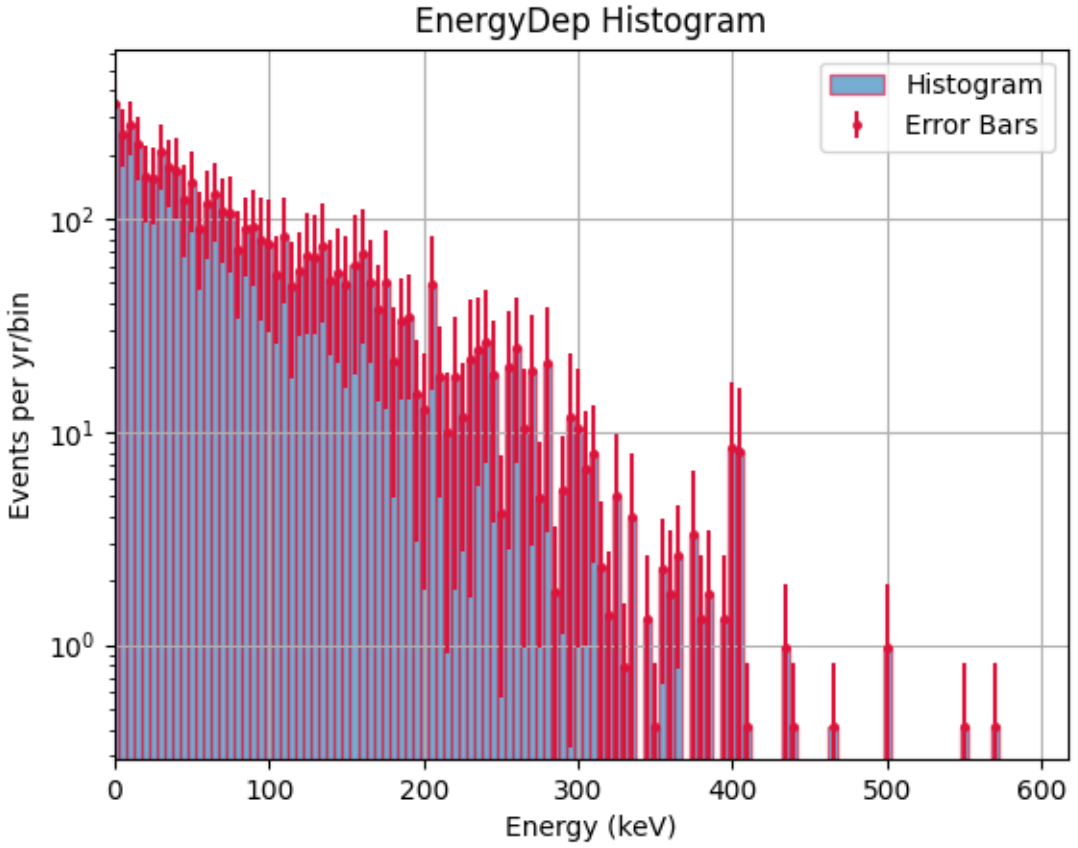




CuLayer_2: 4711.33 ± 344.22
 events per year.
‘**Bi207**’ : 1977.13 ± 282.44
events per year.

CuLayer_3: 2277.51 ± 243.86
 events per year.
‘**Bi207**’ : 941.36 ± 200.70
events per year.

Layer_4 Simulation for **OPERA**



Layer No	Old (event per year)	New (event per year)
Layer_0	17062882.60 ± 833814.012	1377564.09 ± 231539.81
Layer_1	99998.02 ± 61630.88	149202.82 ± 75482.00
Layer_2	3847.45 ± 329.96	4711.33 ± 344.22
Layer_3	1427.76 ± 203.84	2277.51 ± 243.86
Layer_4	576.50 ± 175.83	967.16 ± 165.02

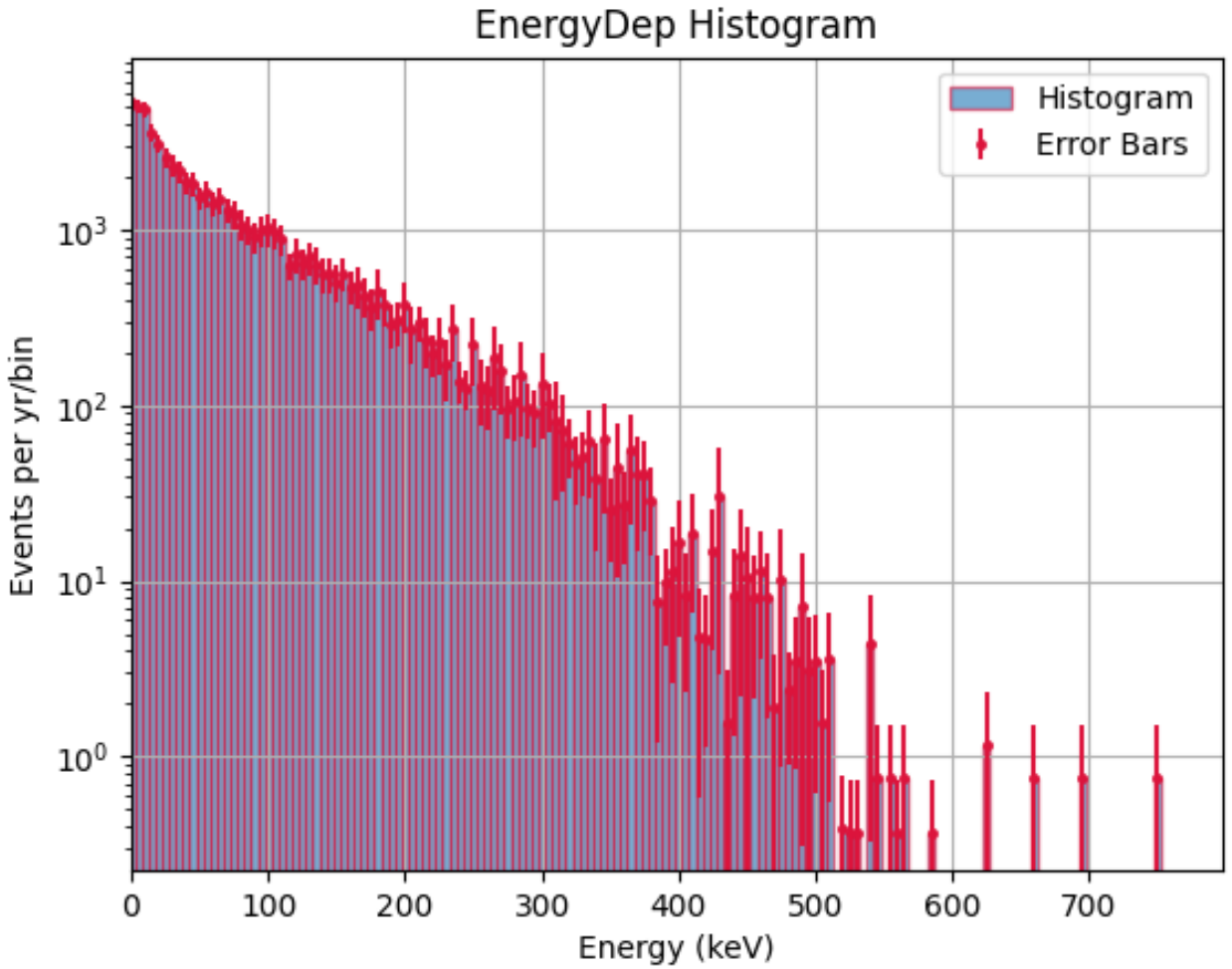
Comparison between previous & new simulation

CuLayer_4: 967.16 ± 165.02 events per year.
'**Bi207**' : 407.65 ± 135.88 events per year.

Comparison between **Schrieber and Opera** for all layers individually

Layer No	SCHRIEBER (event per year)	OPERA (event per year)	Comments
Layer_0	~ (72 ± 2)k (**U238** 28k ± 1.7k)	~(13.7 ± 0.2)M **Pb210**: (13.0 ± 0.2)M	The Opera rate is too high therefore Shrieber is recommended for Layer_0
Layer_1	~(15.7 ± 0.8)k **U238**: (4 ± 0.6)k	~149k ± 75k **Pb210**:(13 ± 7)k	The Opera rate is high therefore Shrieber is recommended for Layer_1
Layer_2	4798.91 ± 396.09 **Co58**: (1000 ± 155)	4711.33 ± 344.22 **Bi207**: (1977 ± 282)	Both are in the same range so both are recommended
Layer_3	1987.18 ± 219.24 **Th232**: (429 ± 71)	2277.51 ± 243.86 **Bi207**: (941 ± 200)	Both are almost in the same range so both are recommended
Layer_4	1184.42 ± 266.23 **U238**: (423 ± 244)	967.16 ± 165.02 **Bi207**: (407 ± 135)	Both are almost in the same range so both are recommended

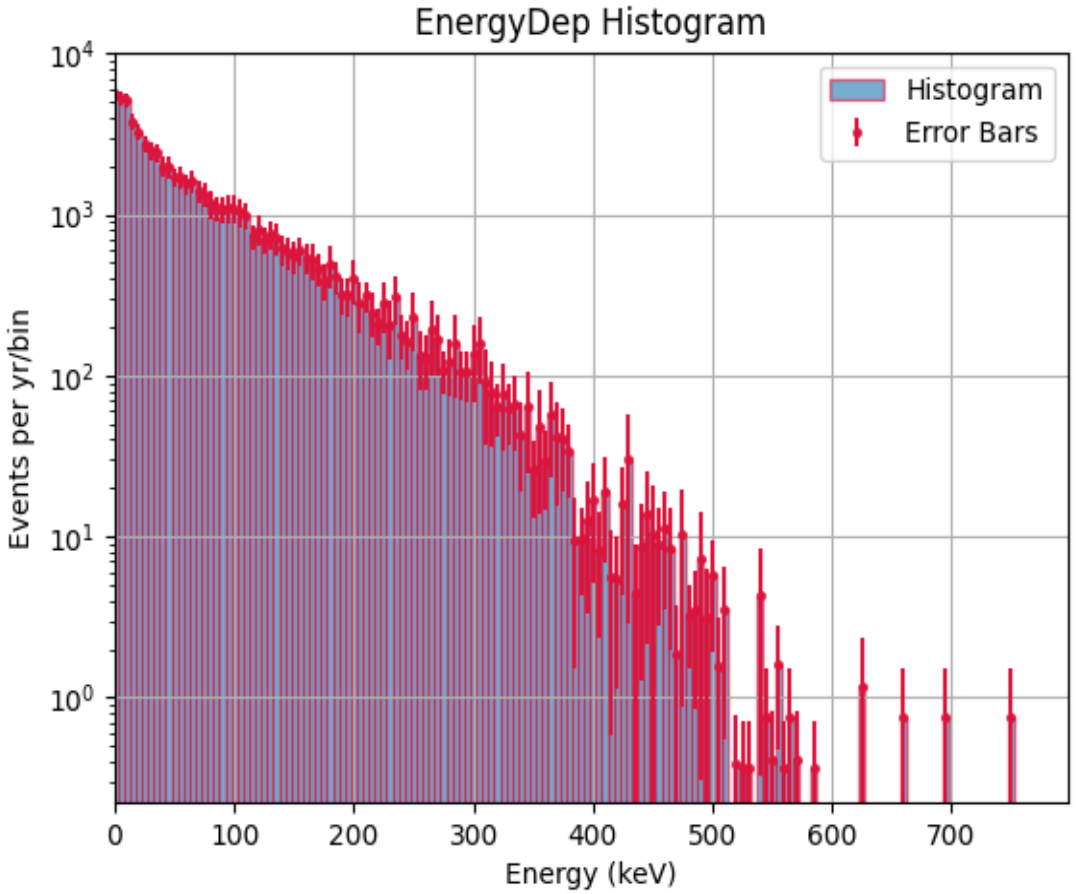
Layer_0 plus Layer_1 combined Simulation of **SCHRIEBER**



CuLayer_0_1: 88466.58 ± 2096.91
 events per year.
'**U238**' : 28773.93 ± 1787.92
events per year.

Here it is worth noticing that the combined simulated events are the simple sum of both the layers 0 and 1 done individually.
i.e
CuLayer_0: 72694.86 ± 1940.51
+
CuLayer_1: 15771.71 ± 794.61
=
CuLayer_0_1: 88466.58 ± 2096.91

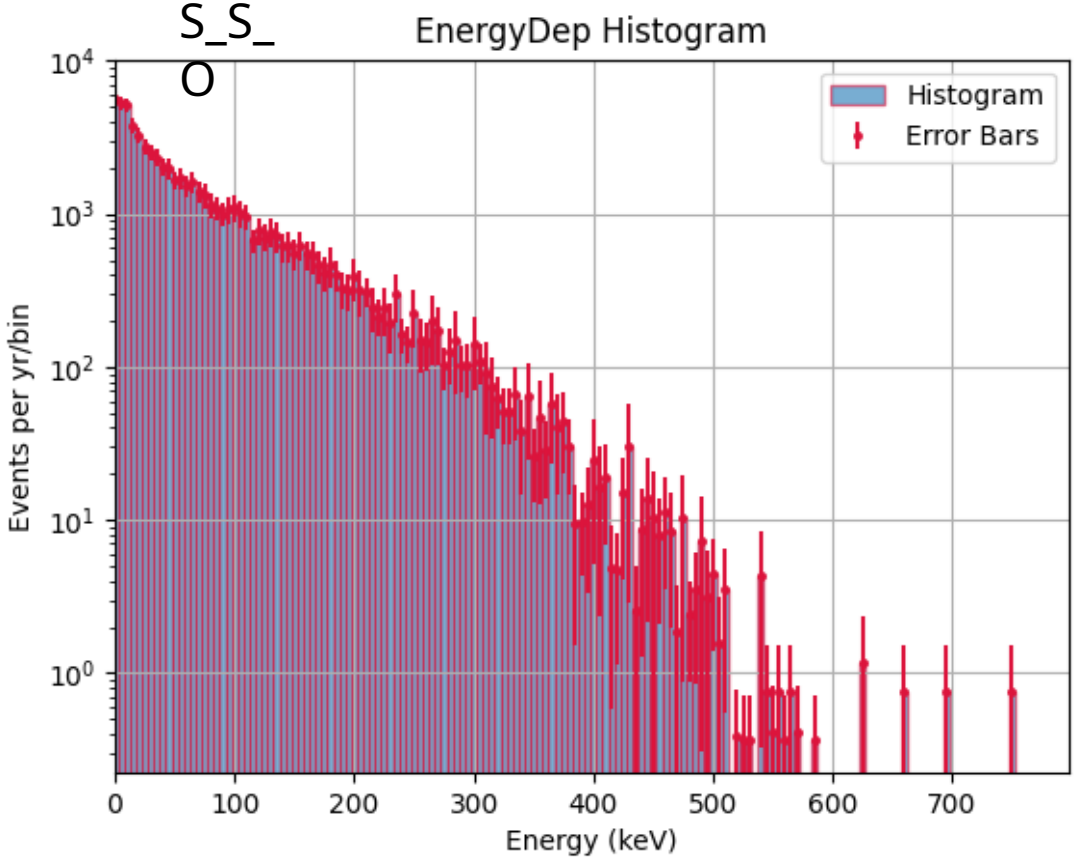
S_S_S(Layer_0_1_2 Combined Simulation of **SCHRIEBER)**



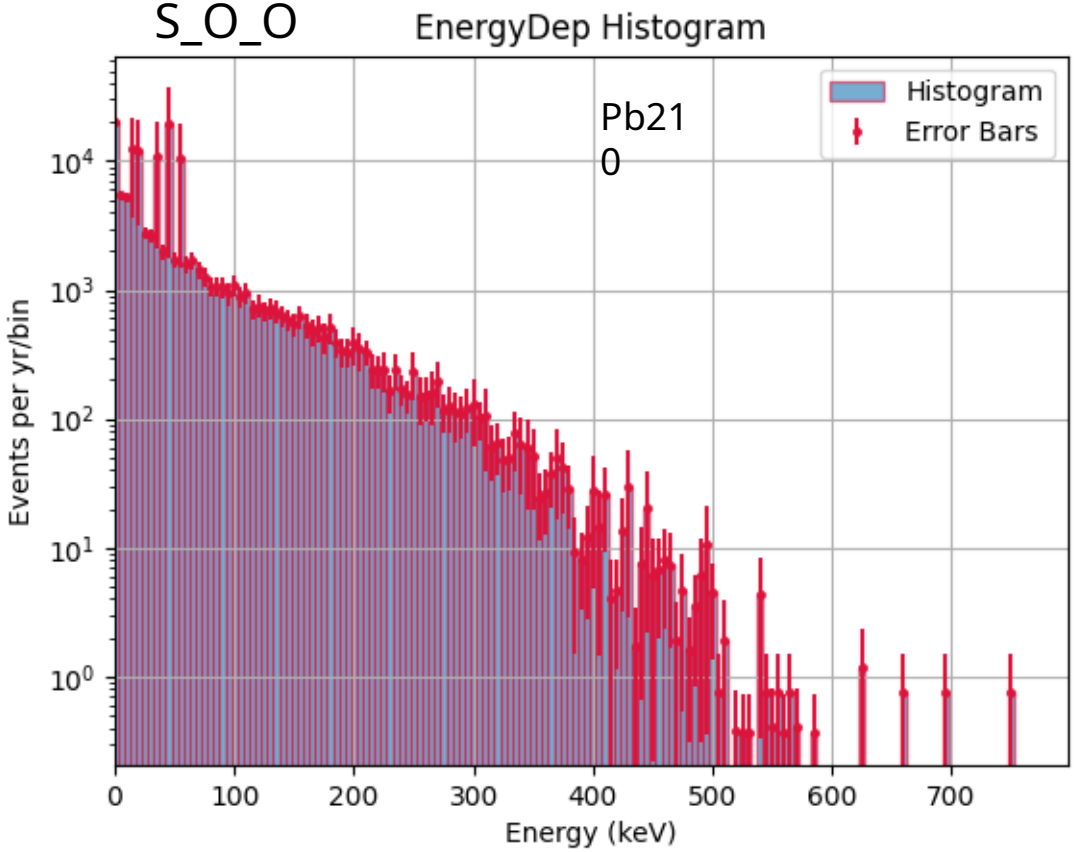
CuLayer_0_1_2: 93265.49 ± 2133.99
events per year.
'**U238**' : 28773.93 ± 1787.92
events per year.

Here it is worth noticing that the combined simulated events are the simple sum of all the layers 0, 1 and 2 done individually.
i.e
CuLayer_0: 72694.86 ± 1940.51
+
CuLayer_1: 15771.71 ± 794.61
+
CuLayer_2: 4798.91 ± 396.09
=
CuLayer_0_1_2 : 93265.49 ± 2133.99

S_S_O

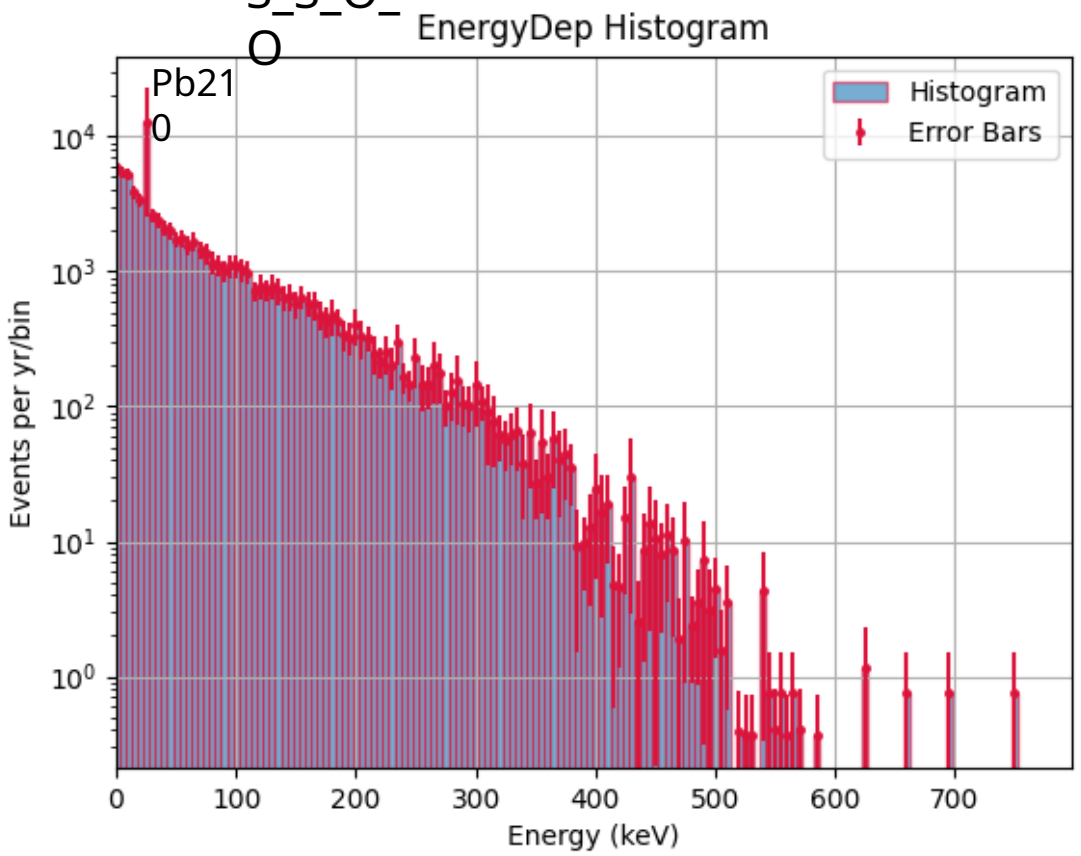


S_O_O

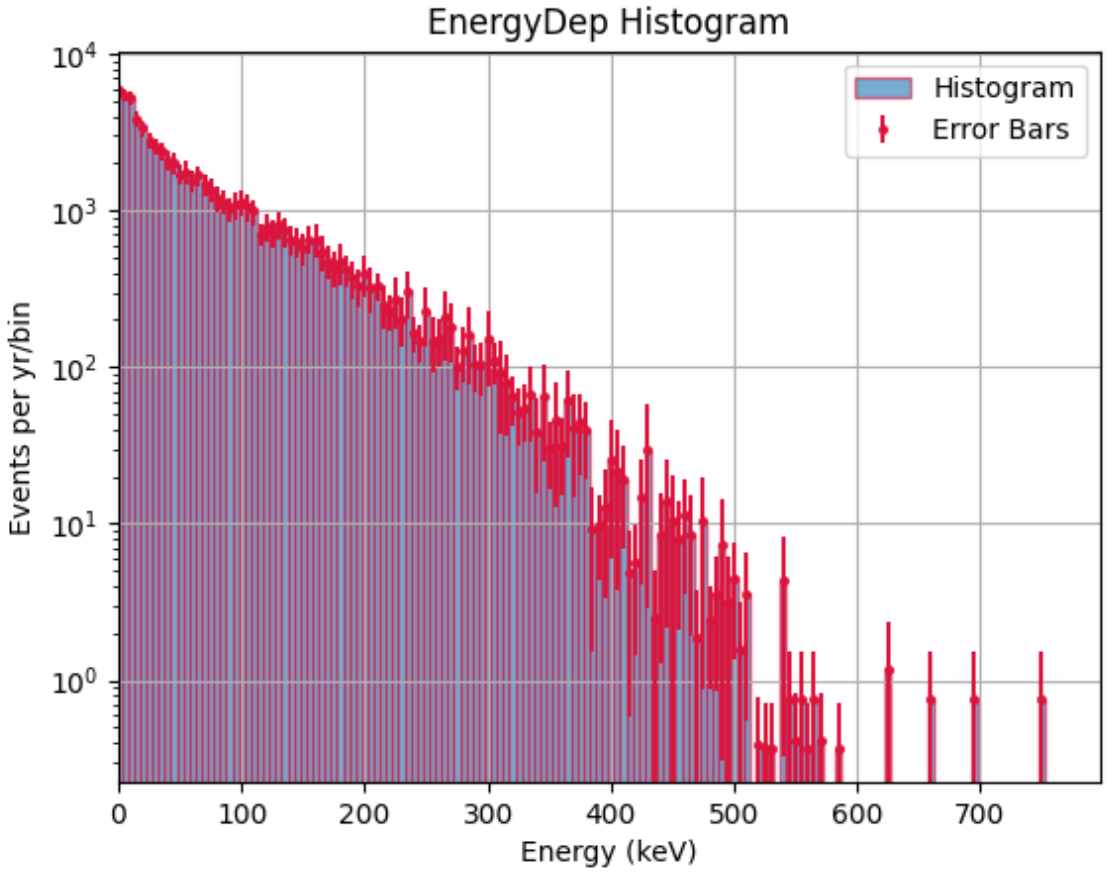


Combination	Events per year with uncertainty	Dominant Isotope
S_S_S	93265 ± 2133	**U238:** 28773 ± 1787
S_S_O	93177 ± 2124	**U238:** 28773 ± 1787

S_S_O_O

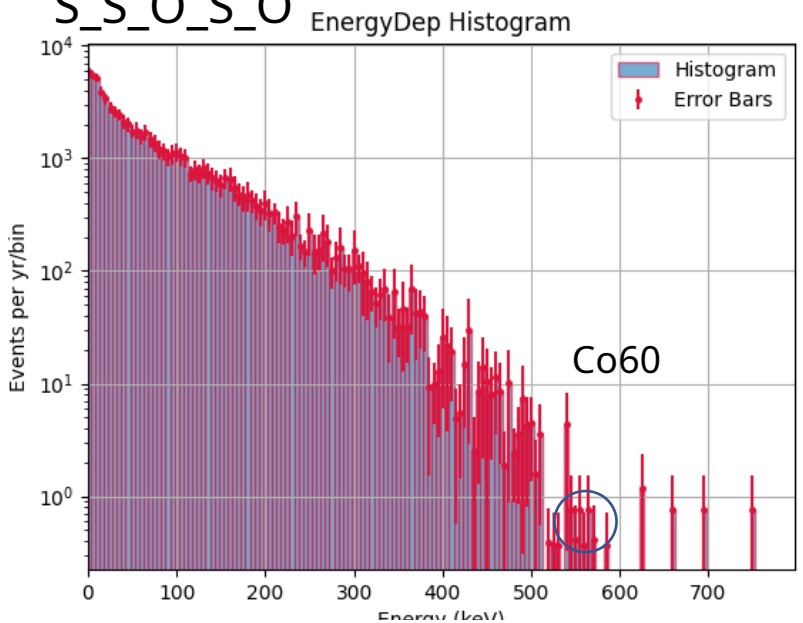


S_S_O_S

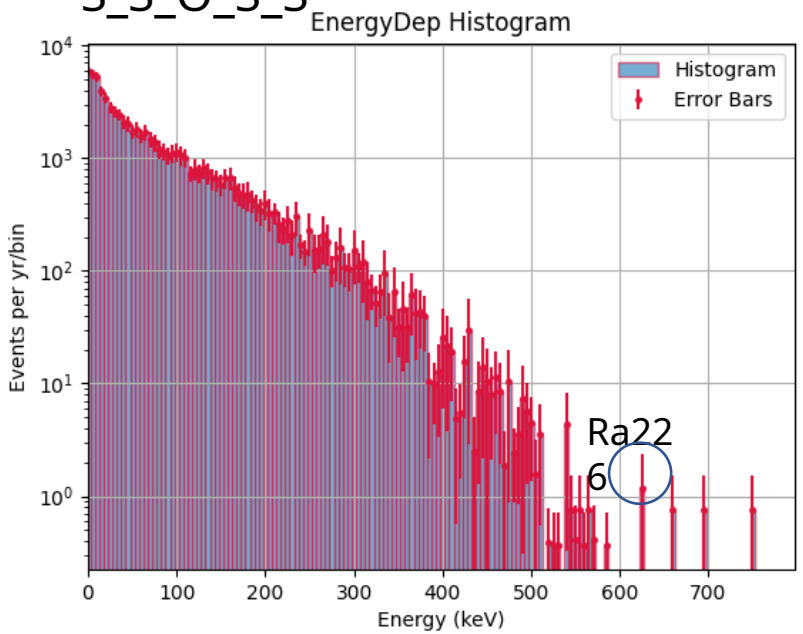


Combination	Events per year with uncertainty	Dominant Isotope
S_S_O_O	95455.43 ± 2138.92	**U238:** 28773 ± 1787
S_S_O_S	95165.09 ± 2136.25	**U238:** 28773 ±

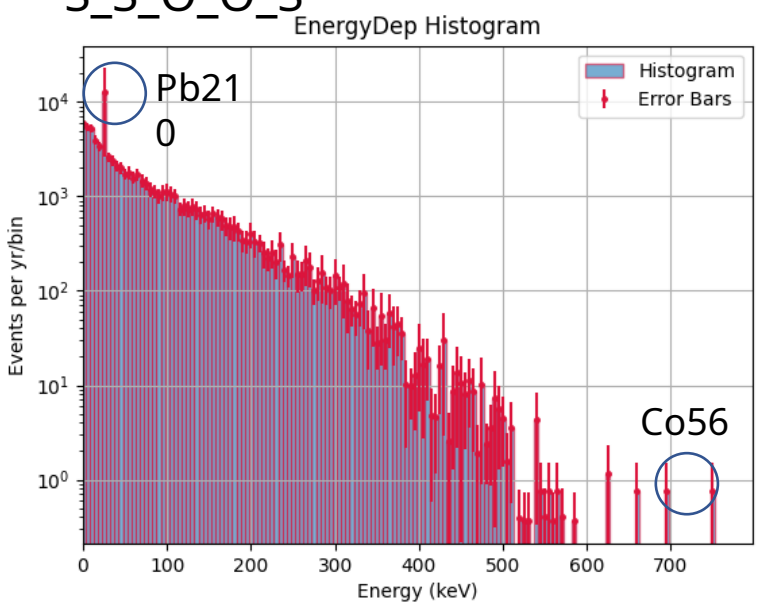
S_S_O_S_O



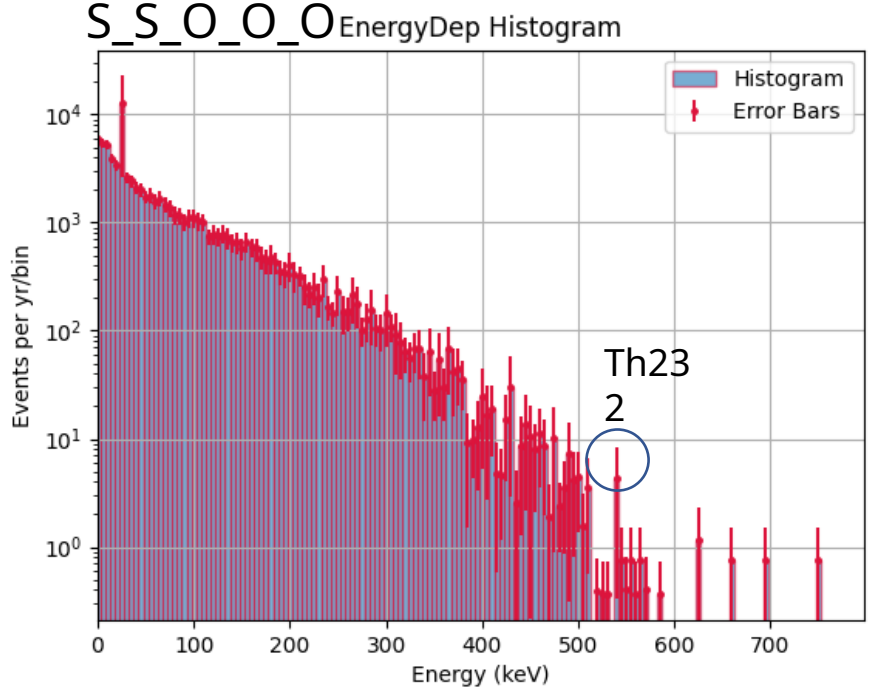
S_S_O_S_S



S_S_O_O_S



S_S_O_O_O



Combination	Events per year with uncertainty	Dominant Isotope
S_S_O_S_O	96132.25 ± 2142.6	**U238:** 28773 ± 1787
S_S_O_S_S	96349.5 ± 2152.7	**U238:** 28773 ± 1787
S_S_O_O_O	96422.5 ± 2145.2	**U238:** 28773 ± 1787
S_S_O_O_S	96639.86 ± 2155.4	**U238:** 28773 ±