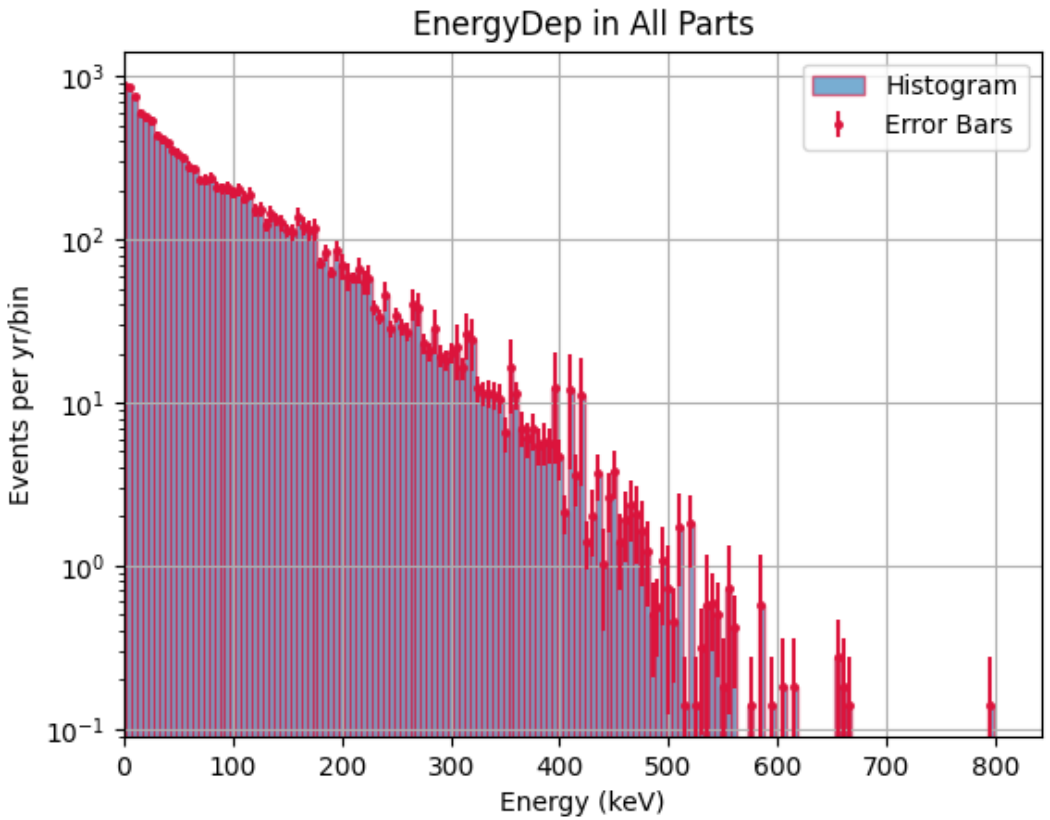
Internal background status

Simulation meeting

Melba D’Astolfo, 28/10/2024

CuLayer_0 - SCHRIEBER reference

1842.92 kg



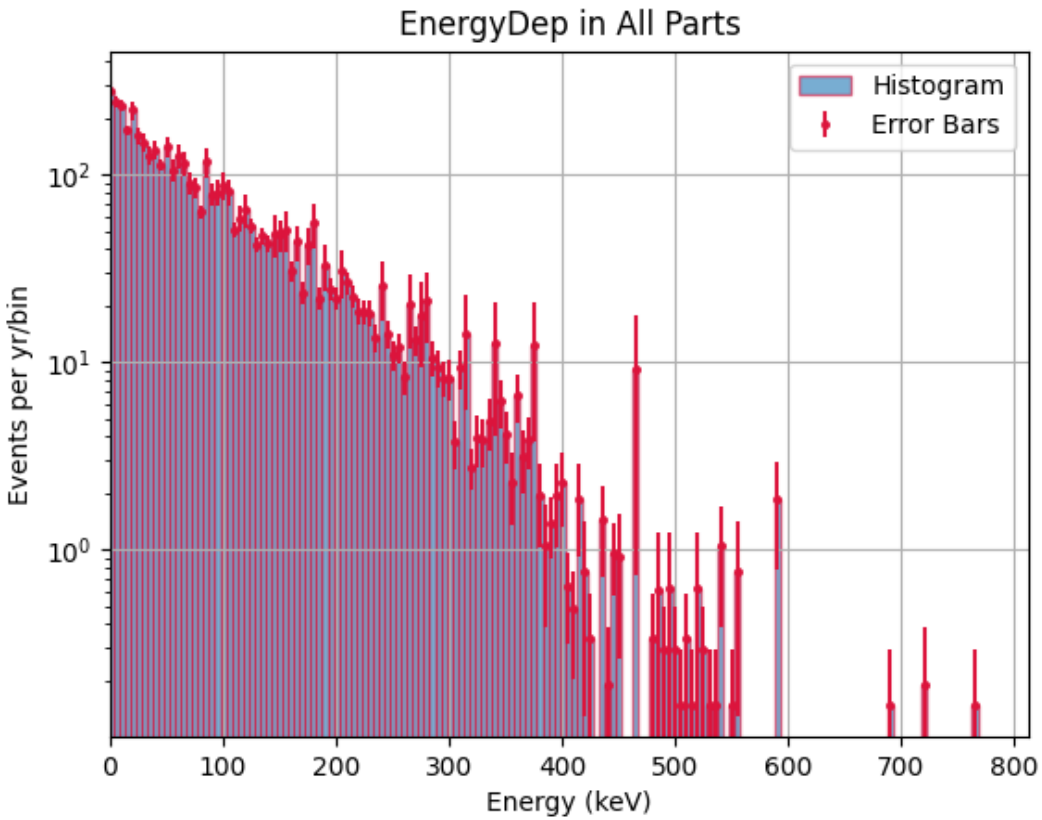
ISOTOPE	ACTIVITY
$^{238}U_{bottom}$	1.00E-04
$^{232}Th_{bottom}$	1.70E-04
^{40}K	6.80E-04
^{137}Cs	1.10E-04
^{60}Co	3.10E-05

Total Rate for events within the energy interval [1, 20] keV from all detectors: 14655 ± 347 events per year

Total Rate for events within the energy interval [0, 3000] keV from all detectors: 59216 ± 683 events per year

CuLayer_1 - SCHRIEBER reference

1959.12 kg



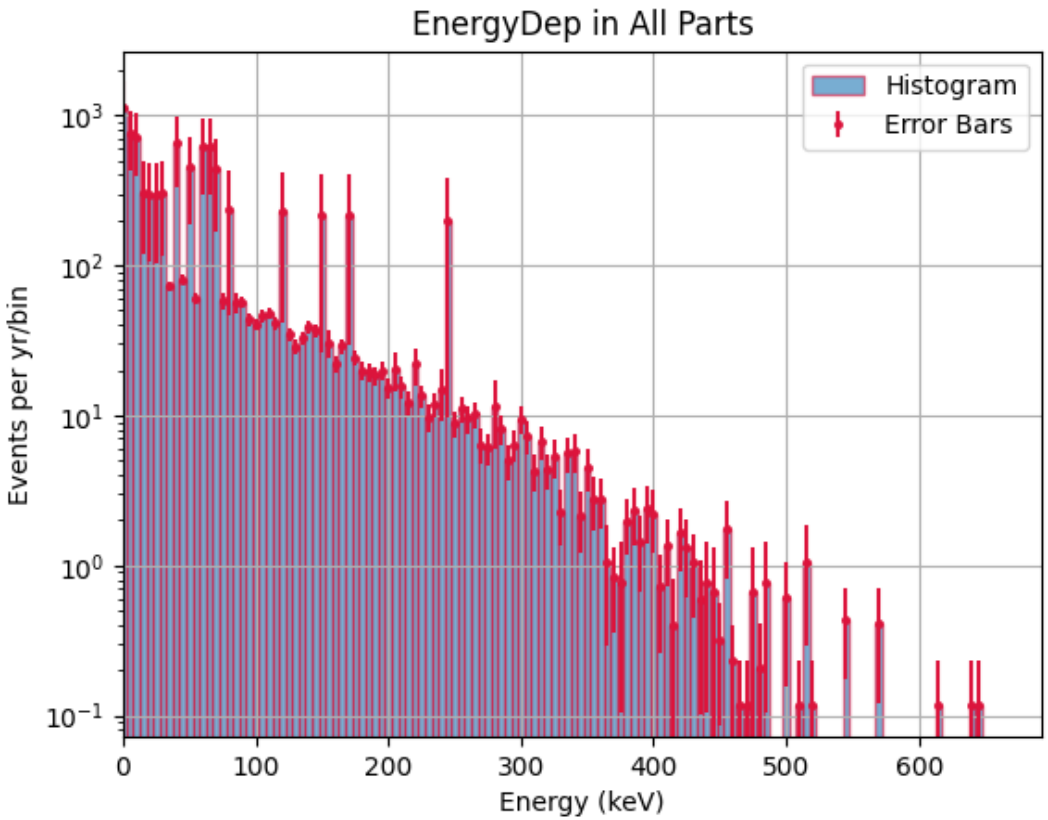
ISOTOPE	ACTIVITY
$^{238}U_{bottom}$	1.00E-04
$^{232}Th_{bottom}$	1.70E-04
^{40}K	6.80E-04
^{137}Cs	1.10E-04
^{60}Co	3.10E-05

Total Rate for events within the energy interval [1, 20] keV from all detectors: 4518 ± 176 events per year

Total Rate for events within the energy interval [0, 3000] keV from all detectors: 20834 ± 428 events per year

CuLayer_2 - OPERA reference

2092.11 kg

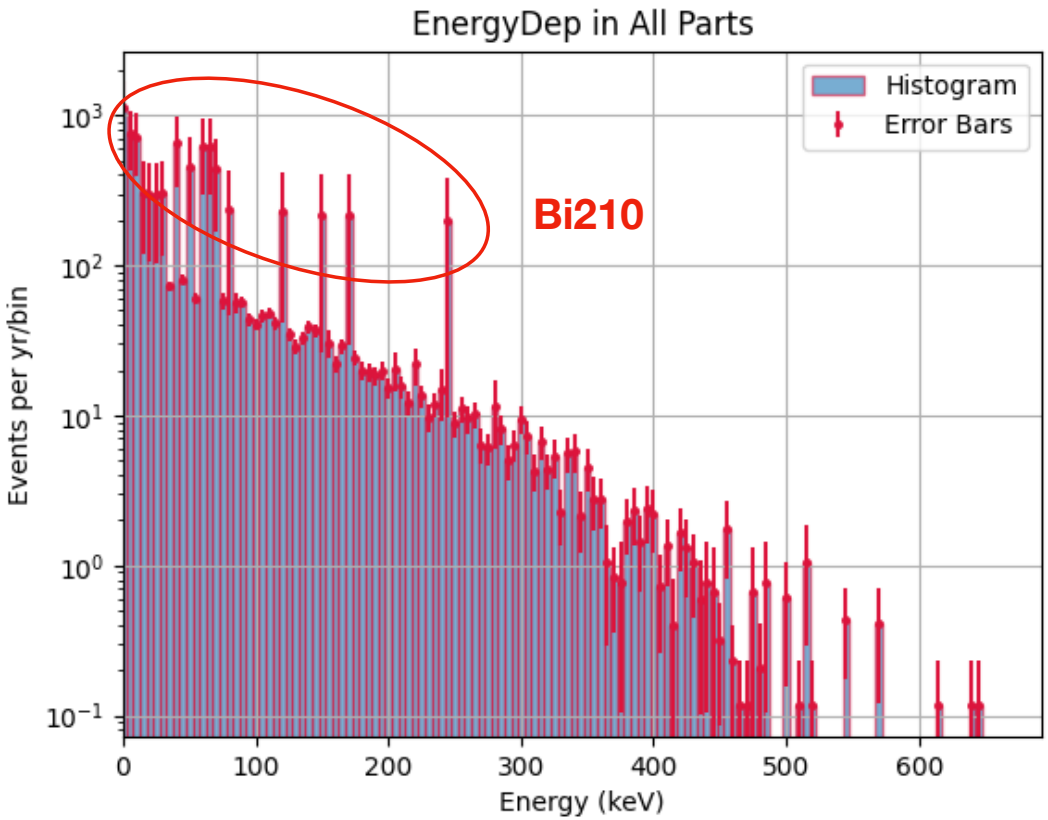


ISOTOPE	ACTIVITY
$^{238}U_{top}$	1.90E-03
$^{238}U_{bottom}$	1.00E-04
^{235}U	5.10E-04
^{232}Th	7.30E-05
^{40}K	4.00E-04
^{137}Cs	2.80E-05
^{60}Co	3.10E-05
^{108m}Ag	2.50E-04
^{107}Bi	6.10E-04
^{210}Pb	7

Total Rate for events within the energy interval [1, 20] keV from all detectors: 10588 ± 2671 events per year

CuLayer_2 - OPERA reference

2092.11 kg



ISOTOPE	ACTIVITY
$^{238}U_{top}$	1.90E-03
$^{238}U_{bottom}$	1.00E-04
^{235}U	5.10E-04
^{232}Th	7.30E-05
^{40}K	4.00E-04
^{137}Cs	2.80E-05
^{60}Co	3.10E-05
^{108m}Ag	2.50E-04
^{107}Bi	6.10E-04
^{210}Pb	7

Total Rate for events within the energy interval [1, 20] keV from all detectors: 10588 ± 2671 events per year

Comparison with June results

	June	October
Layer_0 (1-20 keV) [evts/yr]	56791 ± 1874	14655 ± 347
Layer_1 (1-20 keV) [evts/yr]	11082 ± 749	4518 ± 176
Layer_2 (1-20 keV) [evts/yr]	4641 ± 339	10588 ± 2671
TOTAL	**72514 ± 2047**	**29761 ± 2700**

Significant **improvement** thanks to ICP-MS measurement of Schrieber's copper

Huge statistics required to see first effects of Bi210 in OPERA's copper

→ **more storage space needed**

In light of the updated results, the most viable option is still

4 cm clean copper + 6 cm OPERA