First results from copper shielding simulation

CYGNO-04 internal background

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# Copper references

OPERA

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

SCHRIEBER - SABRE

ISOTOPE	ACTIVITY
$^{238}U_{top}$	1.90E-02
$^{238}U_{bottom}$	1.00E-04
^{235}U	2.10E-04
^{232}Th	1.70E-04
^{40}K	6.80E-04
^{137}Cs	1.10E-04
^{60}Co	3.10E-05
^{58}Co	3.50E-04
^{57}Co	2.60E-04
^{56}Co	6.50E-05
^{54}Mn	4.50E-05
^{7}Be	3.60E-04

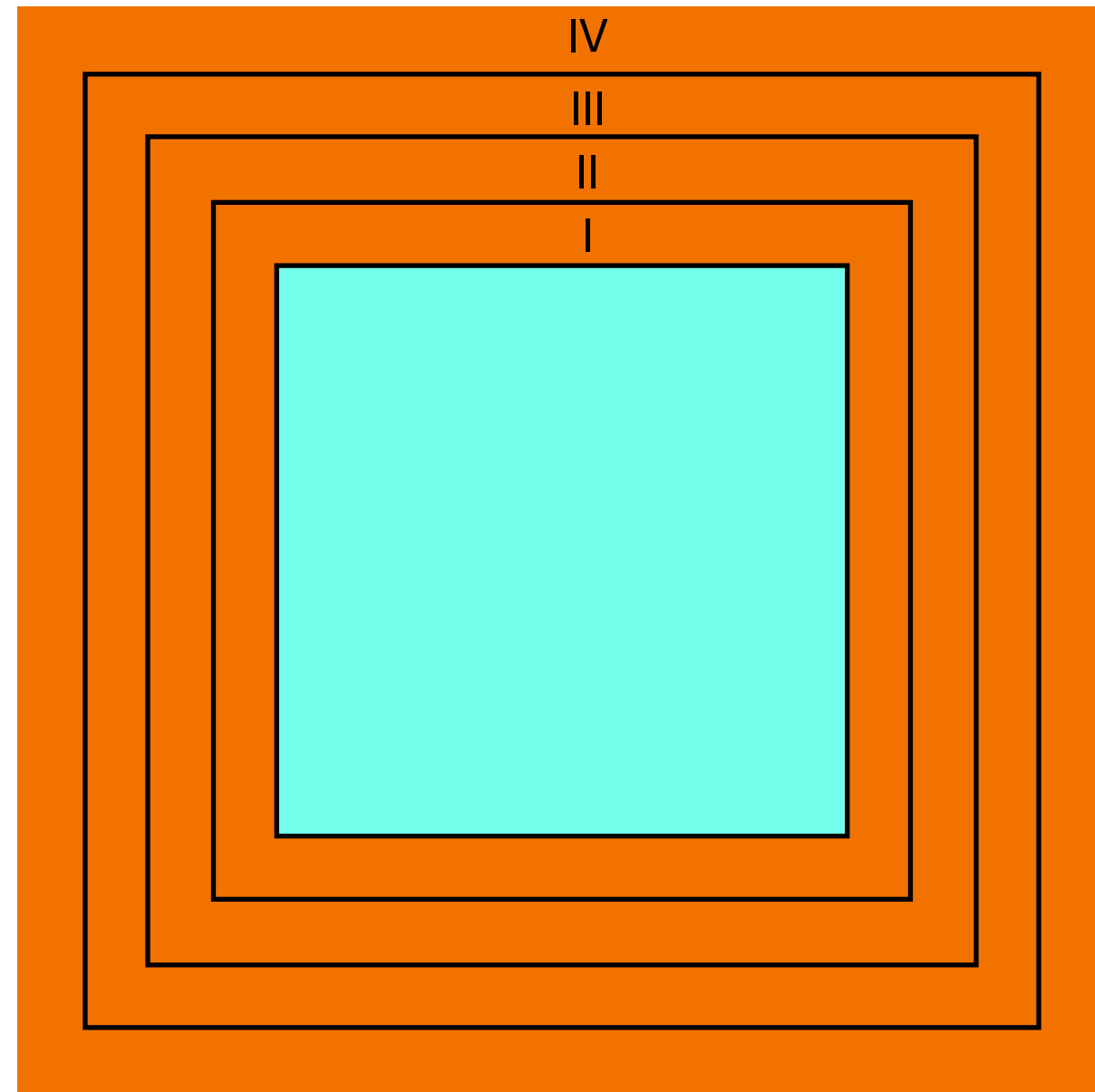# First configuration
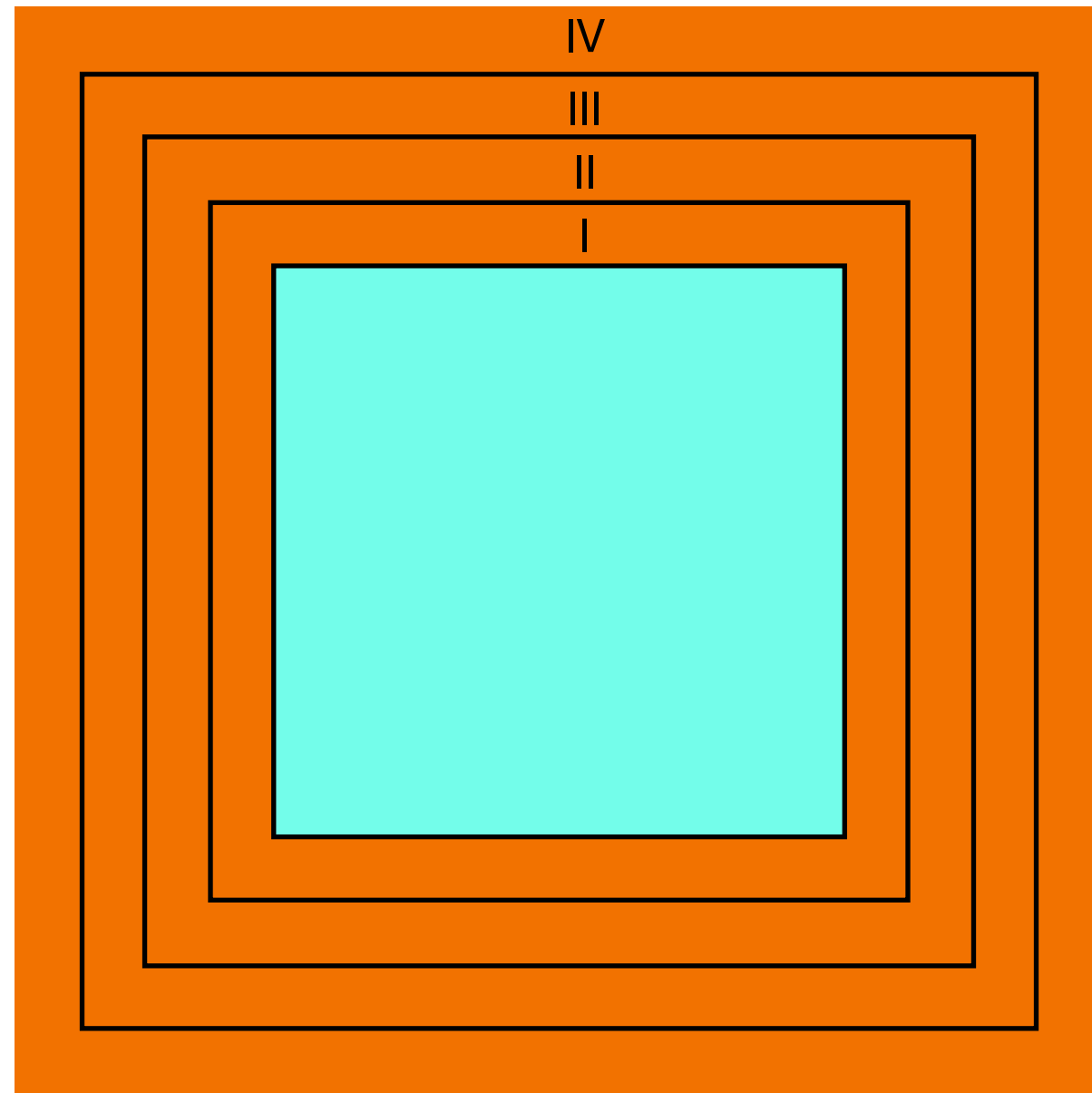
I.   OPERA
II.   OPERA
III.   OPERA
IV.   OPERA
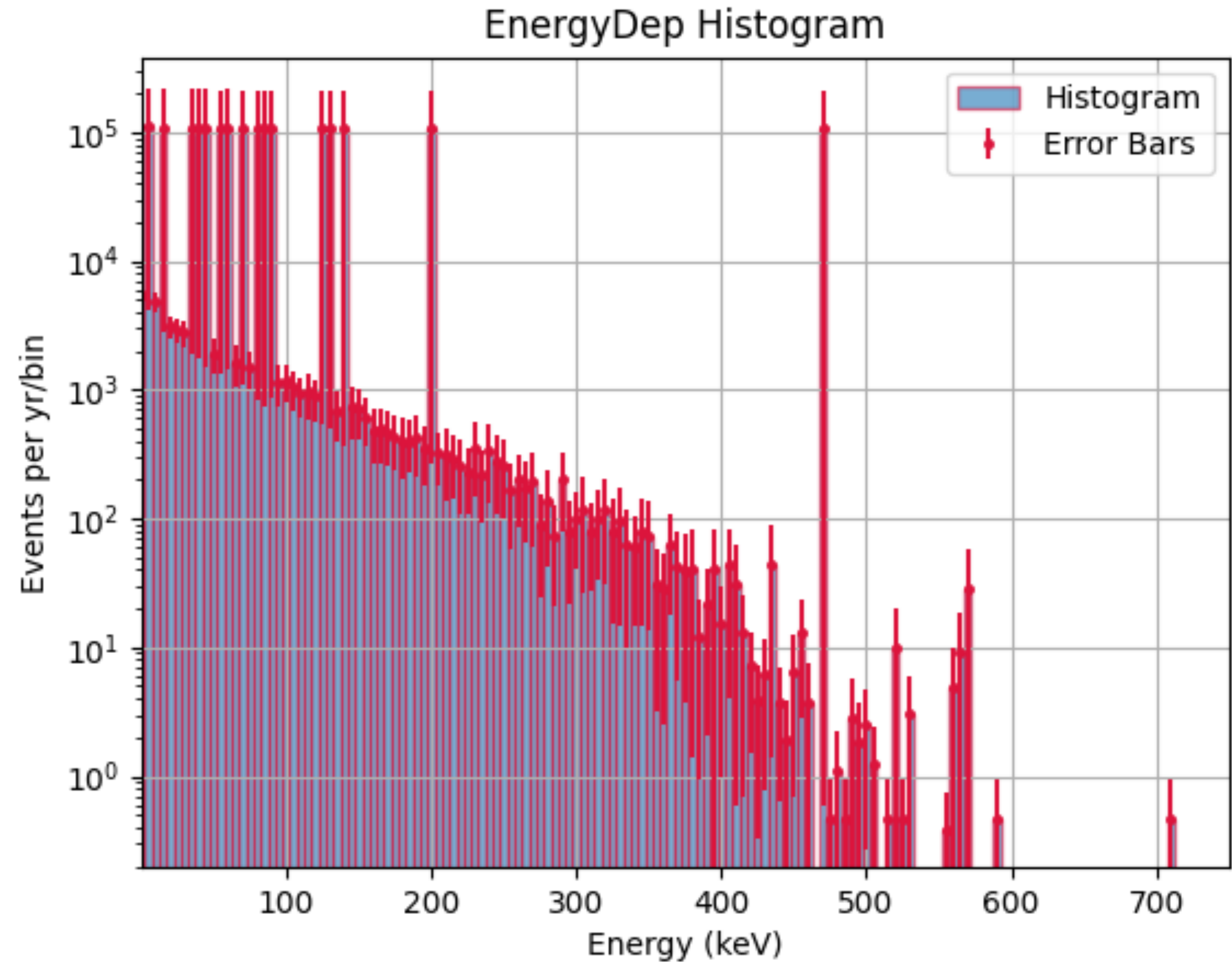
Rate [1,20] keV $= 1.14 \times 10^6$ events per year

Rate I layer [1,20] keV $= 1.13 \times 10^6$ events per year

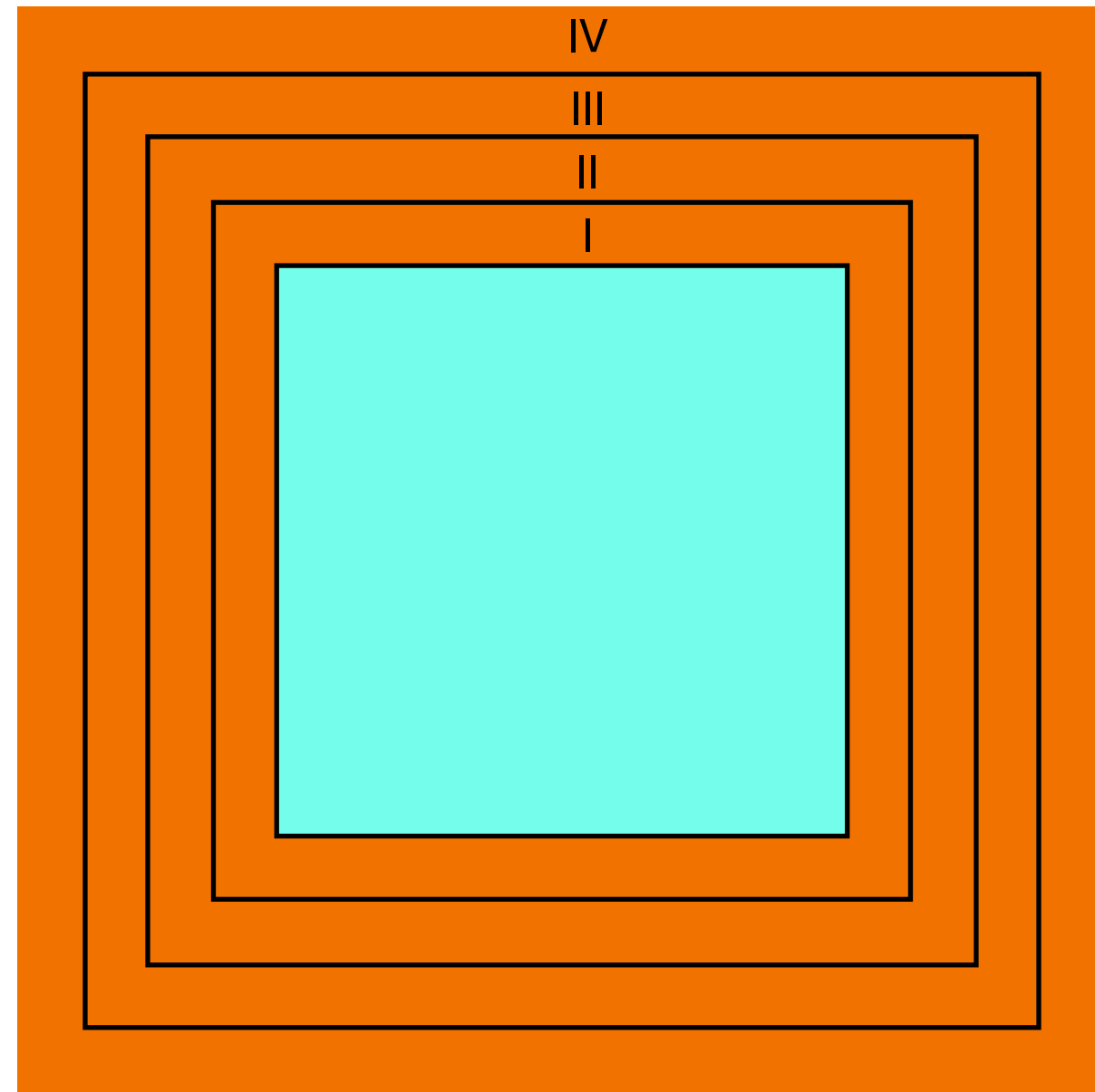# Second configuration

EnergyDep Histogram

I. SCHRIEBER
II. OPERA
III. OPERA
IV. OPERA
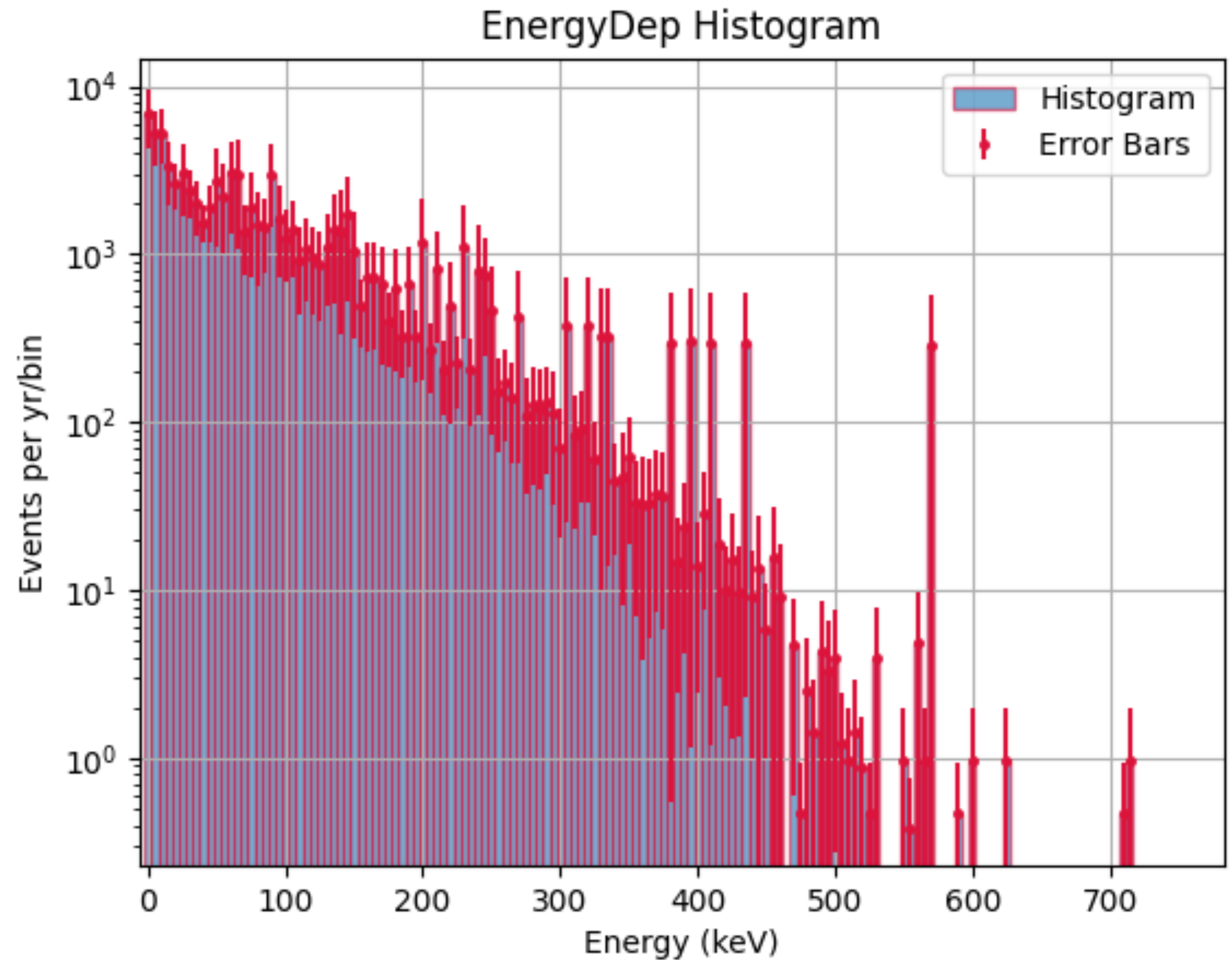
Rate [1,20] keV = 9.10×10^4 events per year

Rate I layer [1,20] keV = 7.60×10^4 events per year
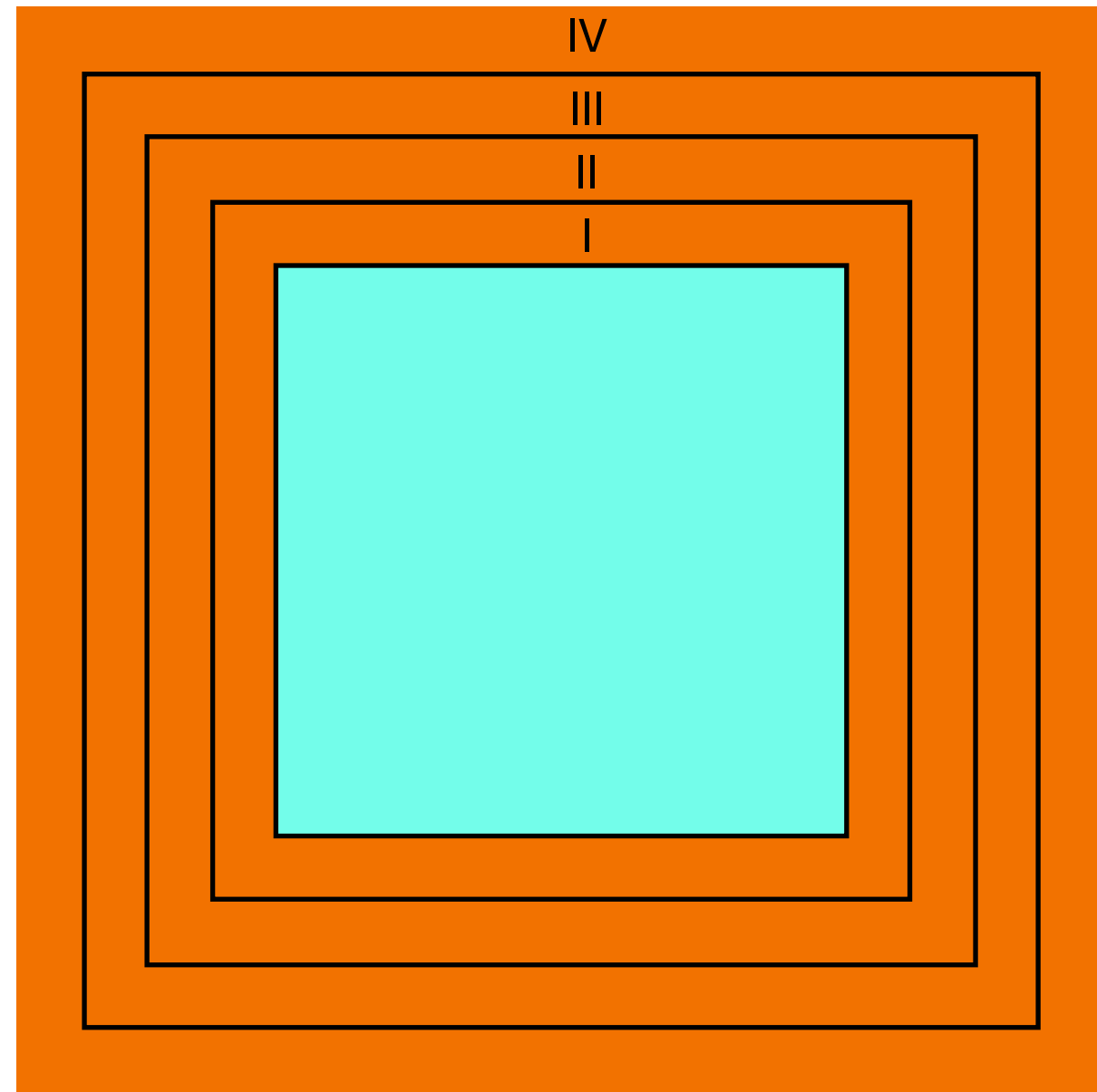
Third configuration

EnergyDep Histogram

I. SCHRIEBER
II. SCHRIEBER
III. OPERA
IV. OPERA
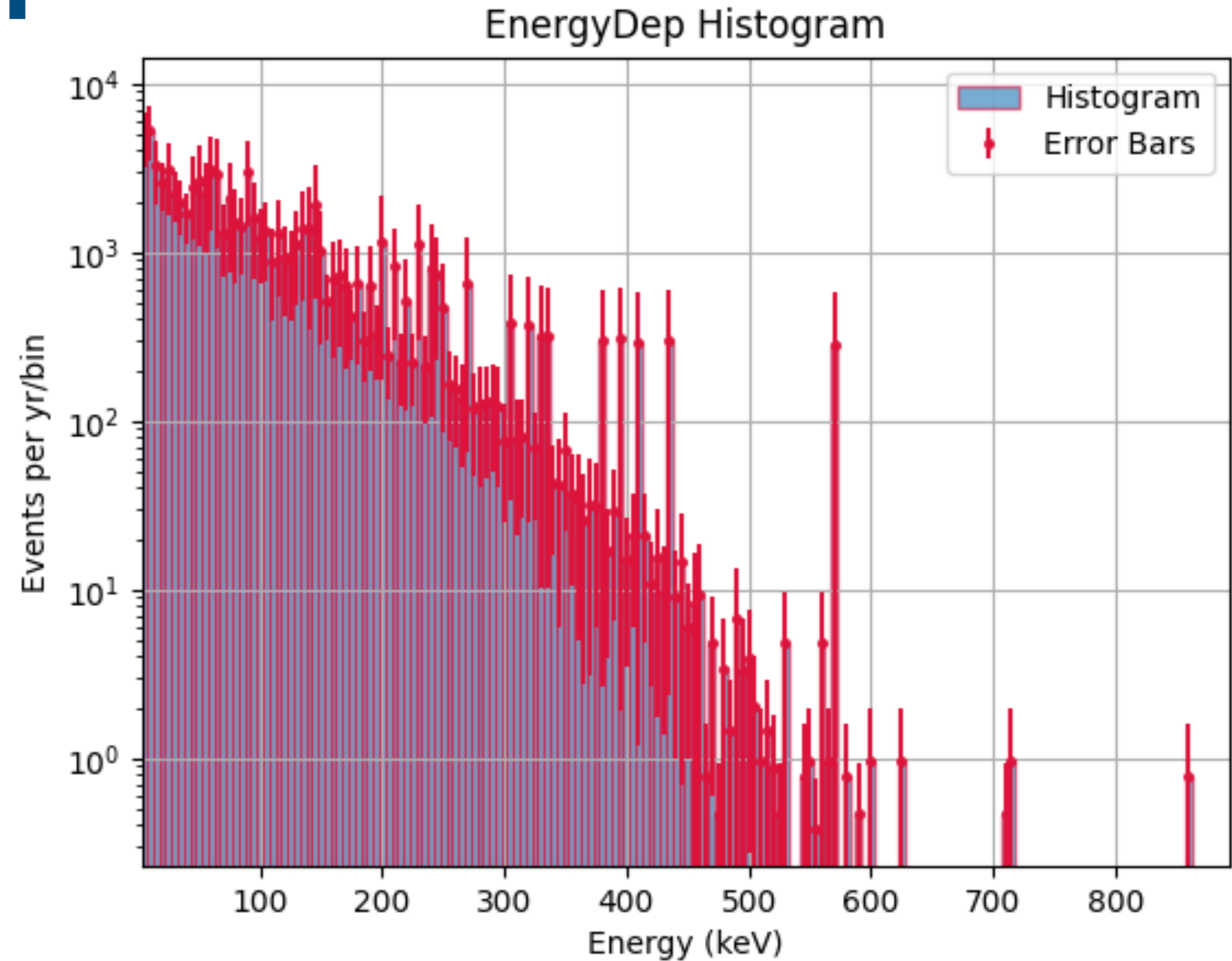
Rate [1,20] keV $= 8.91 \times 10^4$ events per year

Rate I layer [1,20] keV $= 7.60 \times 10^4$ events per year

Conclusion

○ The **first layer** should be **as radio pure as possibile**

○ The **third and fourth** can be made by **OPERA** copper, since their contribution is subdominant

○ To determine the type of copper for the **second layer** we need **higher statistics**