BULLKID
Simulation meeting

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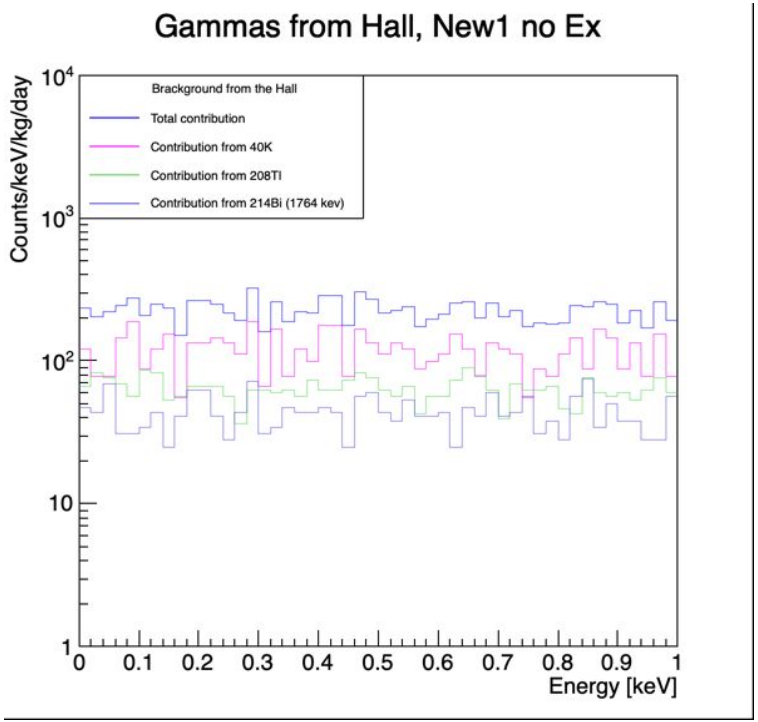
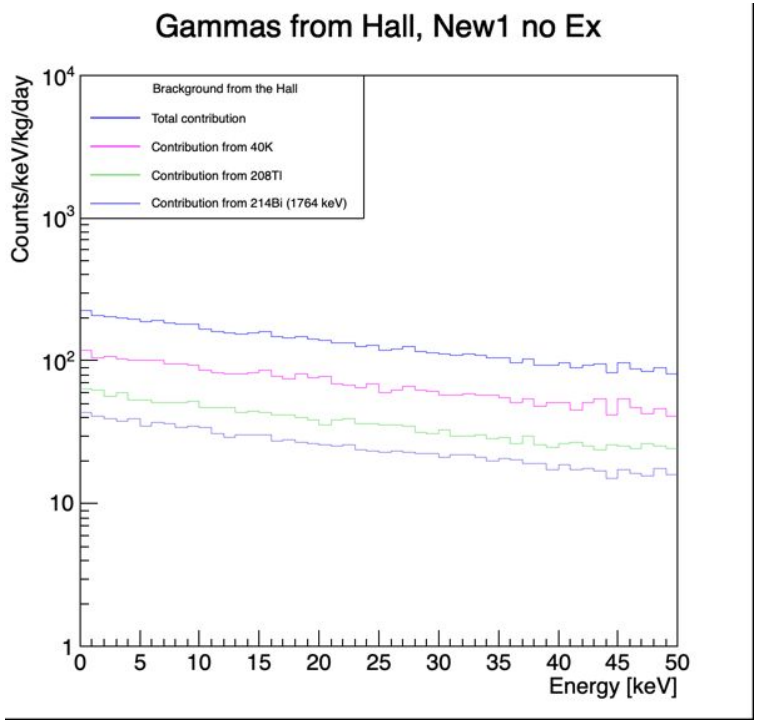
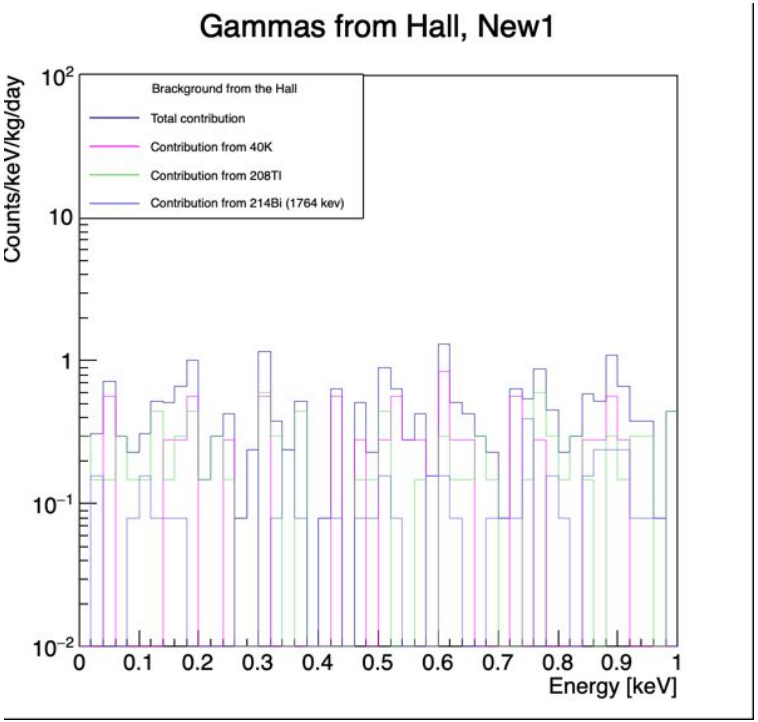
- Considering
  - Internal shield
    - copper around the detector
    - copper block on top of the detector
      - modifying its dimensions
    - ultrapure copper
      - sides, bottom, and top: 1 cm
    - B_4C
      - sides, bottom, and top: 2 cm
  - External shield
    - copper and lead, plus the hat shield

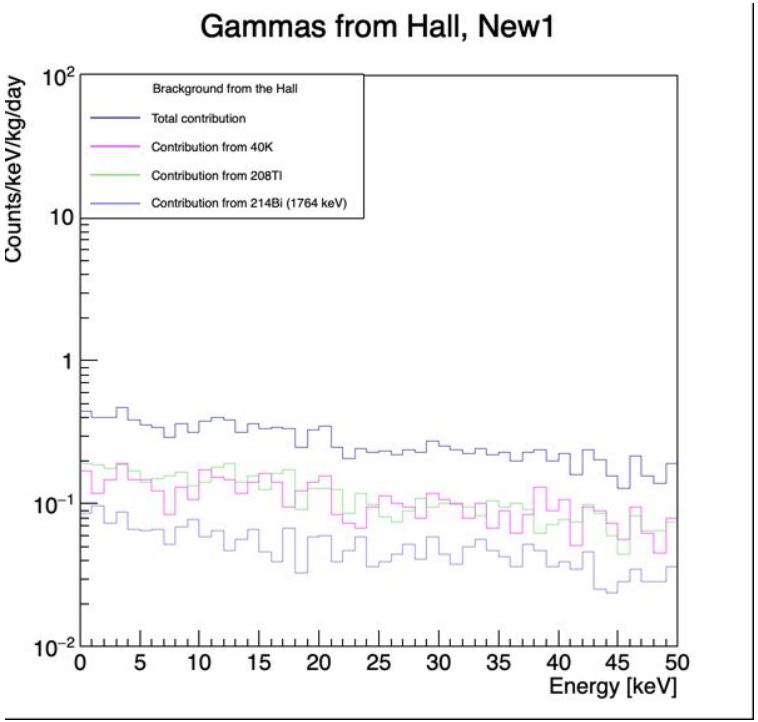
- Internal shielding without external shielding
  - NEW1



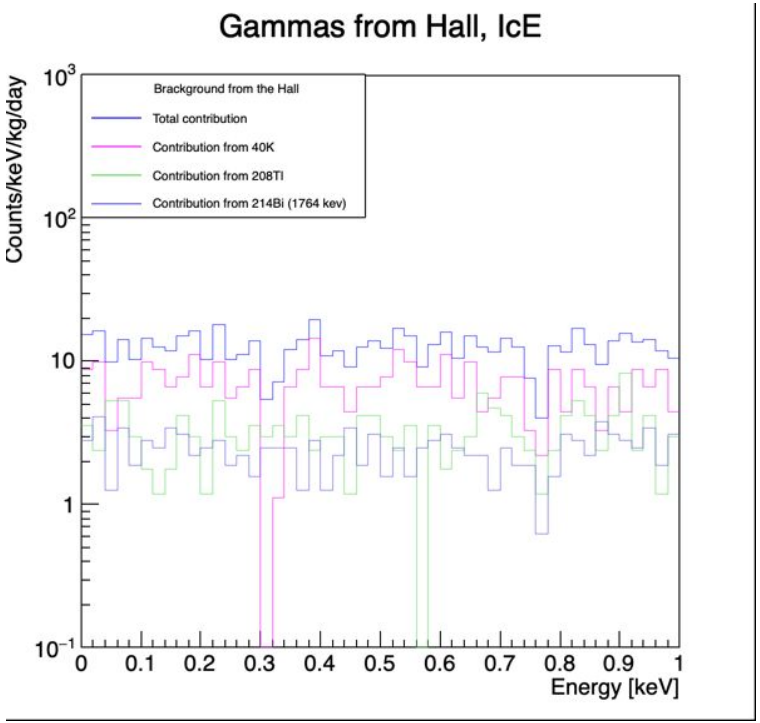


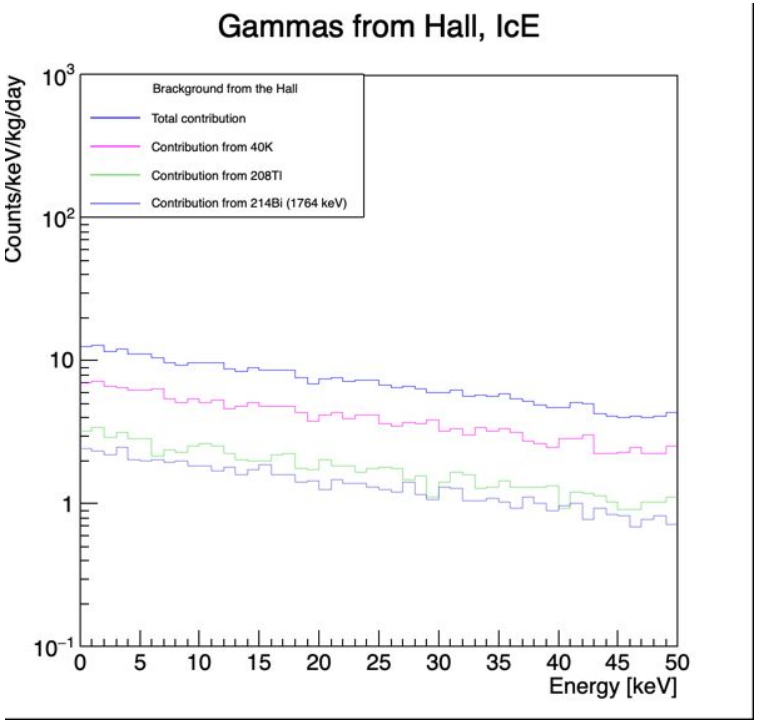
- Internal shielding plus external shielding
  - NEW1



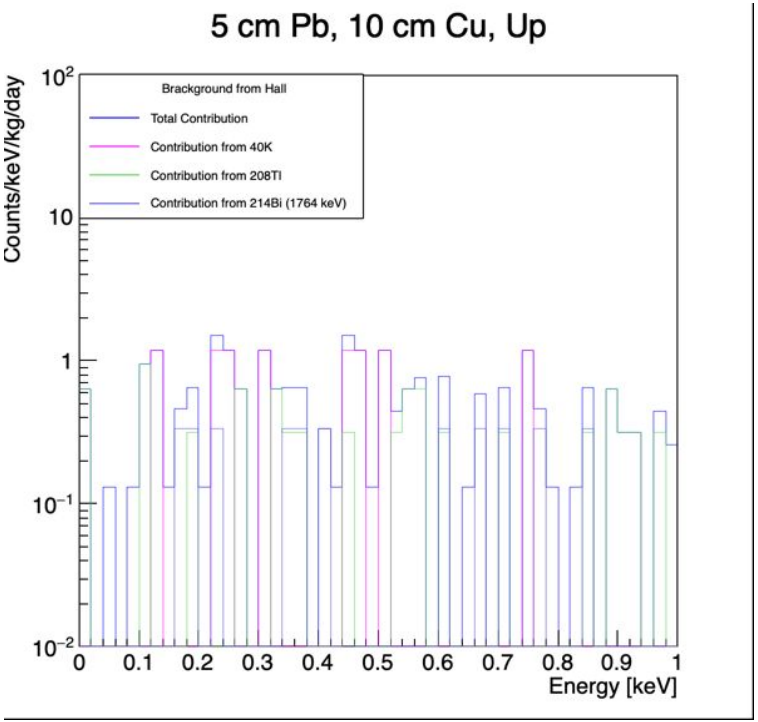


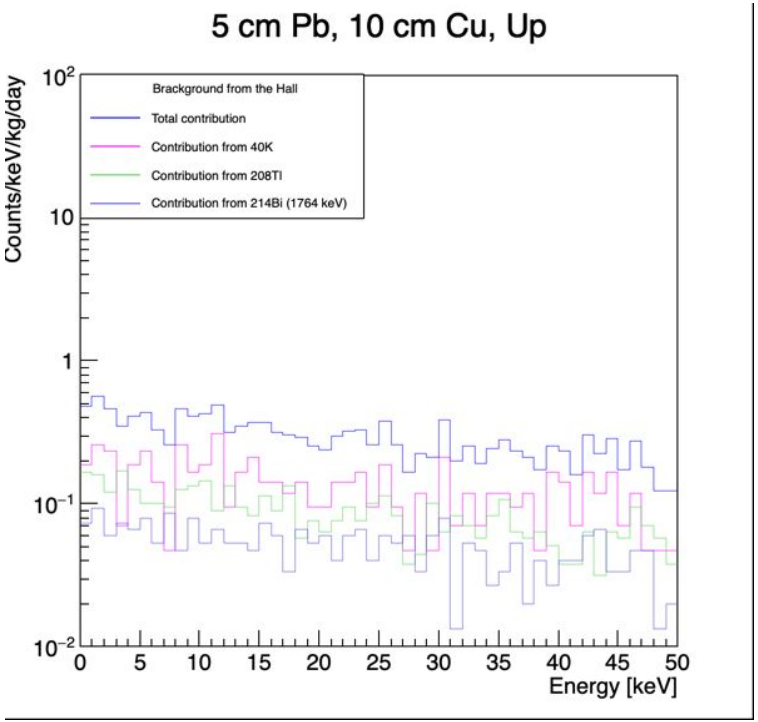
- External shielding plus copper block top (10 cm)



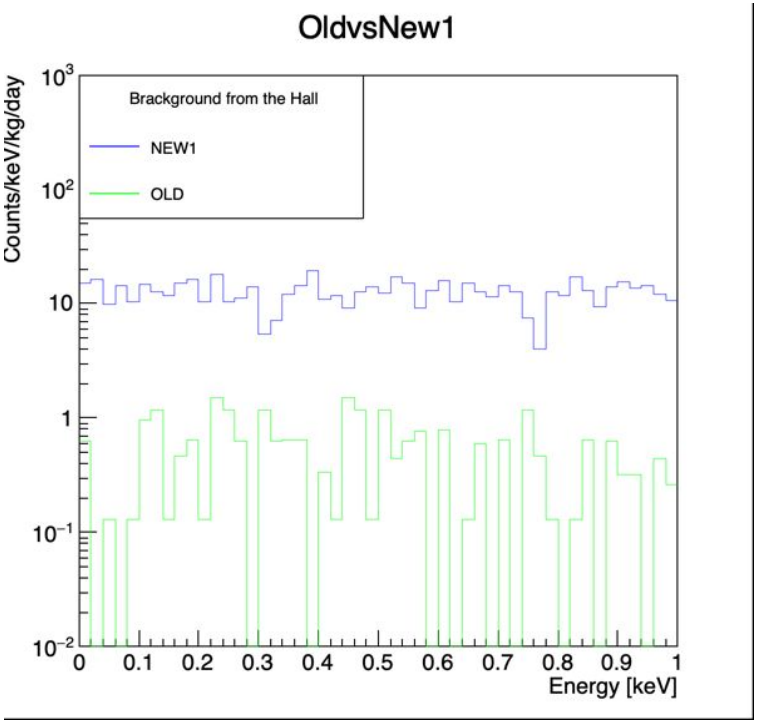


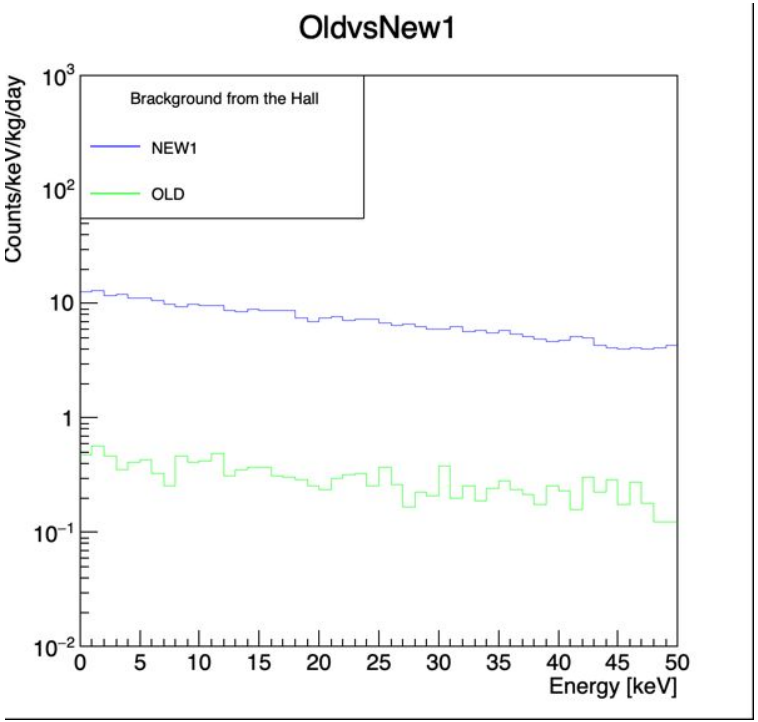
- From previous simulations to include the hat shield
  - External shielding plus copper block top (10 cm)





- Comparing before and NEW1

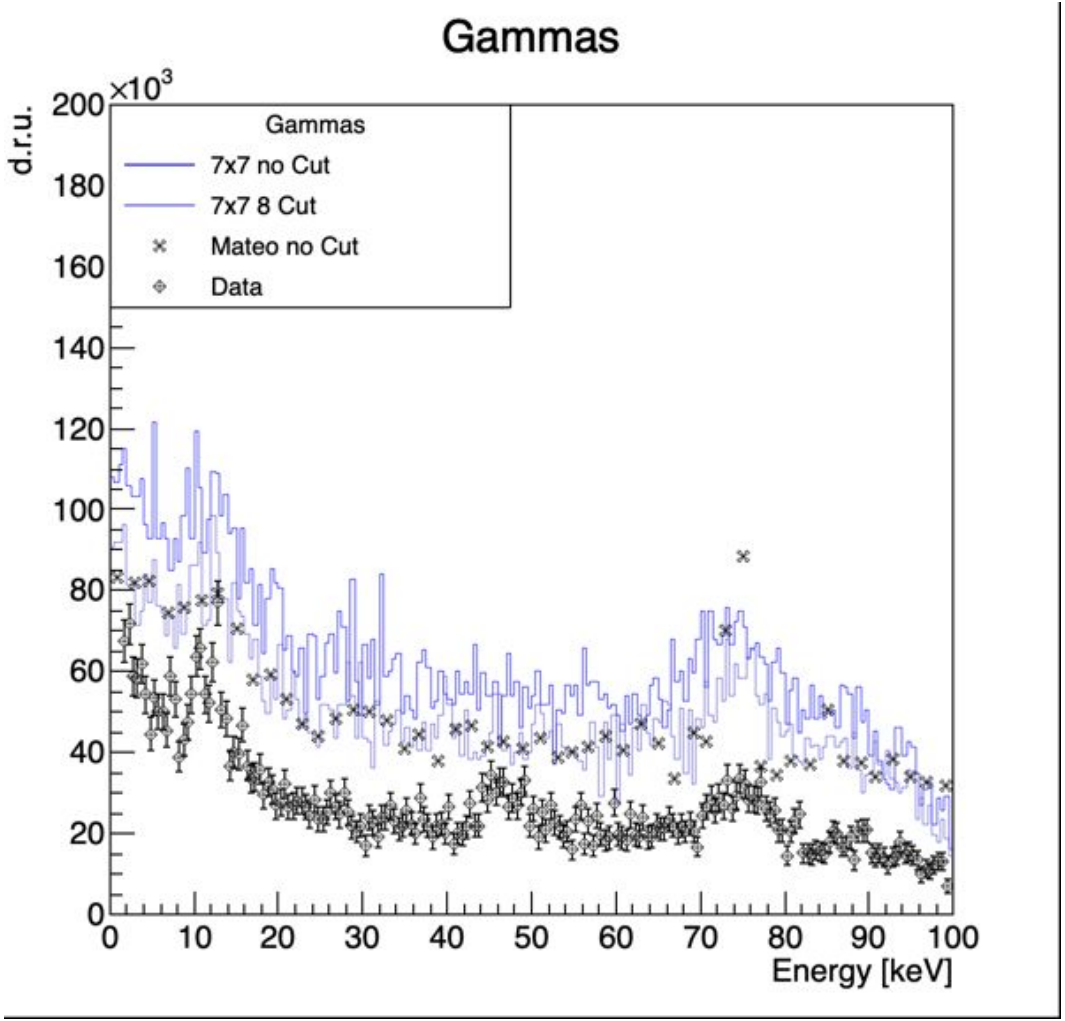




- Currently running NEWA
  - External plus 18 cm on top
  - Sides and bottom, 5 cm made of air
  - Copper mass is almost the same as NEW1
    - NEW1 199.179 kg (only copper)
    - current mass 197.998 kg (only copper)
- B_4C mass increases 4.197 kg
- Total mass NEW1 232.8 kg
- Total mass NEWA 238.18 kg

Summary

- In past simulations, the copper block had a bigger radius
  - Before, radius = 17.9 cm
  - NEW1, radius = 15 cm
- Hat shield was closer to the cryostat
  - Hole radius before = 30.25 cm
  - Hole radius now = 31 cm
- There were the 10 cm of lead below the ceiling
- Does these differences are enough to explain the results?
- 6 cm on sides and bottom, plus 2 cm on top extra, reduce one order of magnitude
  - Main contribution from above the detector
- 5 cm on sides and bottom, plus 8 cm extra on top, how much would reduce?


Gammas
×10^3
d.r.u.
200
180
160
140
120
100
80
60
40
20
0
Gammas
7x7 no Cut
7x7 8 Cut
Mateo no Cut
Data
0
10
20
30
40
50
60
70
80
90
100
Energy [keV]