• 10 p.e. threshold @ WLS
• 4 cm long WLS

Close to the edges of the crystal.
Almost no dependence on DOI.

3 WLS multiplicity goes to 0.

- 10 p.e. threshold @ WLS
- 3 mm long WLS
• 5 p.e. threshold @ WLS
• 3 mm long WLS
The important question is: is there any dependence of the z-resolution on WLS multiplicity?

10 p.e.

1 WLS hit = 1.3 mm
2 WLS hit = 0.3 mm
3 WLS hit = 0.4 mm

5 p.e.

1 WLS hit = 2.4 mm
2 WLS hit = 0.5 mm
3 WLS hit = 0.4 mm

10 p.e.

1 WLS hit = 0.7 mm
2 WLS hit = 0.4 mm
3 WLS hit = 0.5 mm
- 7.5 p.e. threshold @ WLS
- 4 cm long WLS
- 8 LYSO crystals

Thres. = 10 p.e.

Thres. = 7.5 p.e.

Thres. = 5 p.e.

Mean WLS 1 = 54.8833
Mean WLS 2 = 61.6011
Mean WLS 3 = 70.8895
- 7.5 p.e. threshold @ WLS
- 4 cm long WLS
- 8 LYSO crystals
- black separators

Thres. = 10 p.e.

Thres. = 7.5 p.e.

Thres. = 5 p.e.

✓ Difference with respect to 3 mm WLS + 1 LYSO
Simulation due to attenuation in WLS strips.
Z resolution vs multiplicity w/o and w black separators

7.5 p.e.

w/o black separators

7.5 p.e.

w black separators
Conclusions

- The dependence of WLS multiplicity and its influence on the total light output has been investigated.
- 4 simulation studies:
  - 1 LYSO + 26 WLS 4 cm long
  - 1 LYSO + 26 WLS 3 mm long
  - 8 LYSO + 26 WLS 4 cm long
  - 8 LYSO + 26 WLS 4 cm long + black separators
- The increase of the signal with #WLS is already reduced moving from 1 LYSO to 8 LYSO.
- By adding the black separators, the multiplicity 3 is totally suppressed and the light yield for 1 and 2 WLS fired is almost the same.
- We can then assert that the difference was due to light escaping laterally from crystals, then there’s no need to simulate the carbon plate placed below the WLS array.
- The difference in light yield is much smaller than the measured one confirming its source has to be searched elsewhere (e.g. pedestal subtraction).