

Update: Light Simulation

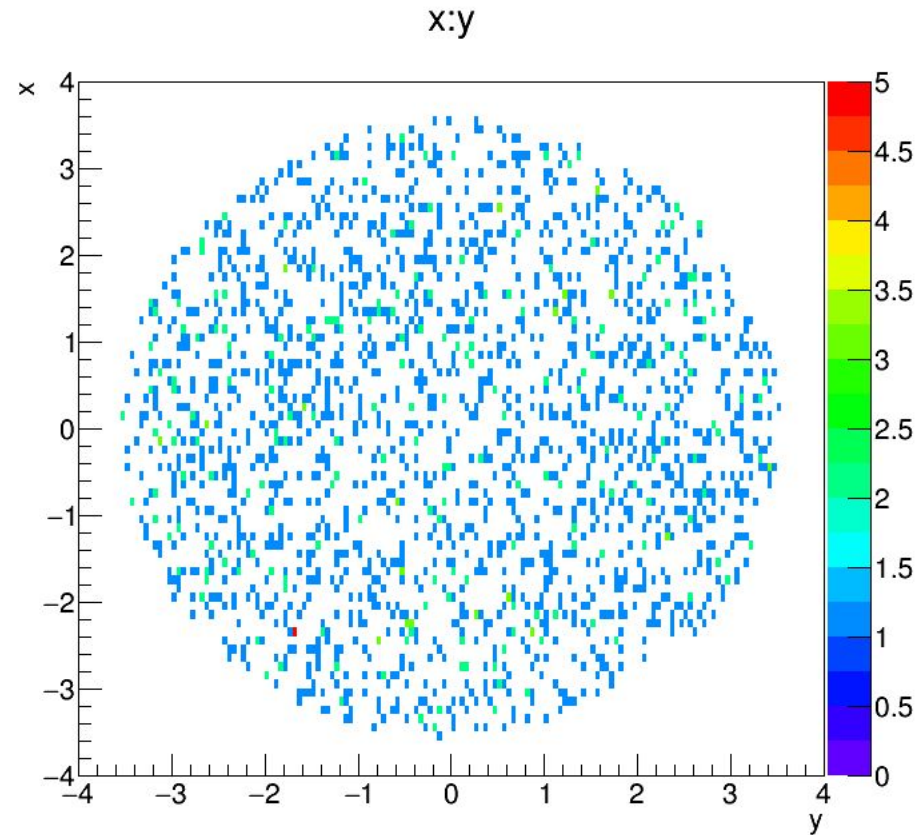
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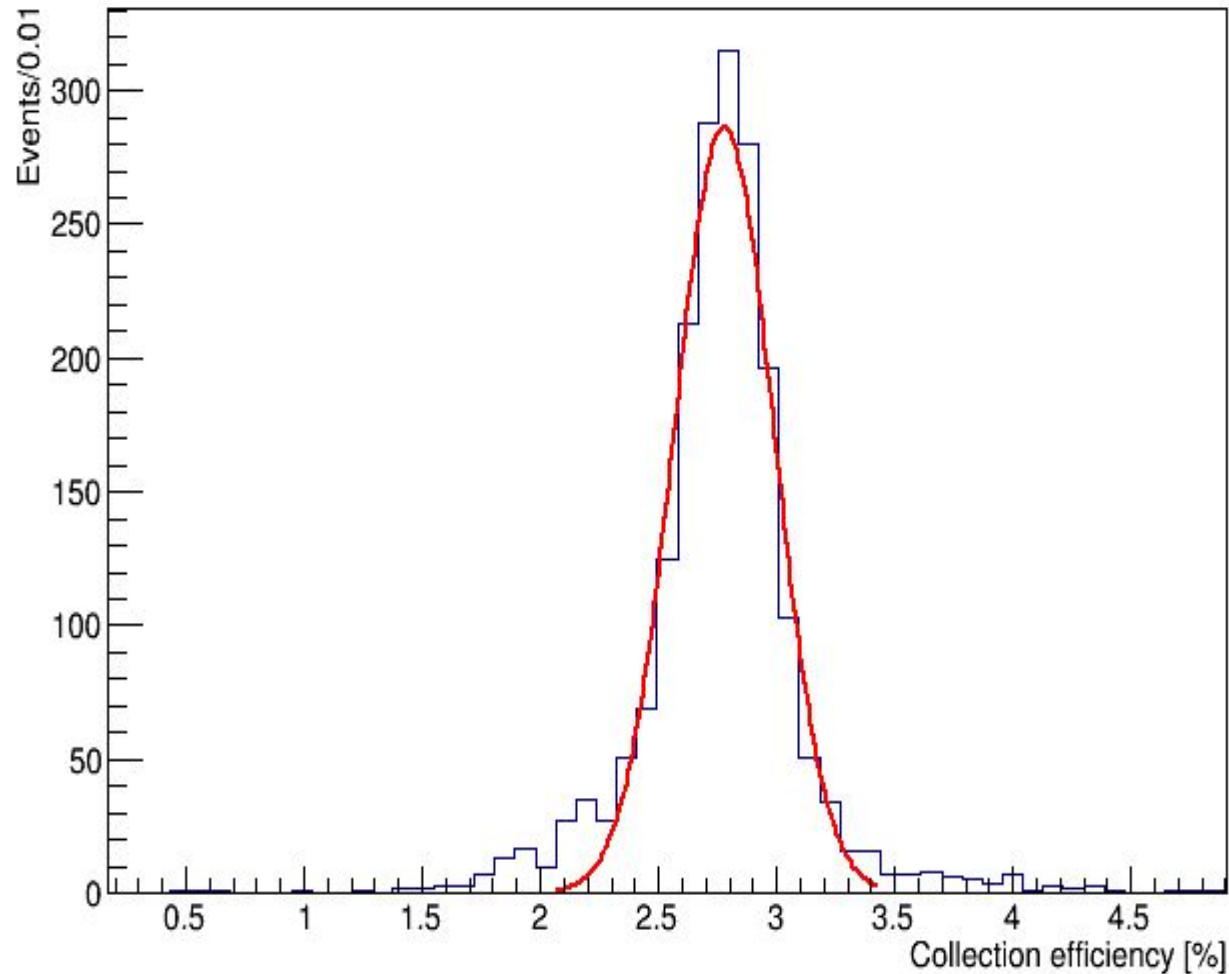
5-02-2019

Geometry implemented

- TPB (100 μm) + Acrylic (6 mm)+ Reflector
- **No reflector at top or bottom**
- Active volume: radius ~ 3.55 cm height ~ 18.8 cm
- Two SiPM tiles (top+bottom)
8.4 x 12.5 mm
- Photo detection efficiency (PDE) ~ 0.4
- Different optical surfaces defined.
- TPB “ground” surface implemented.
- Electronic PCB absorption length 1 nm.
- SiPM, acrylic and other materials defined as in DS-20k.
- 2000 ^{39}Ar events generated.

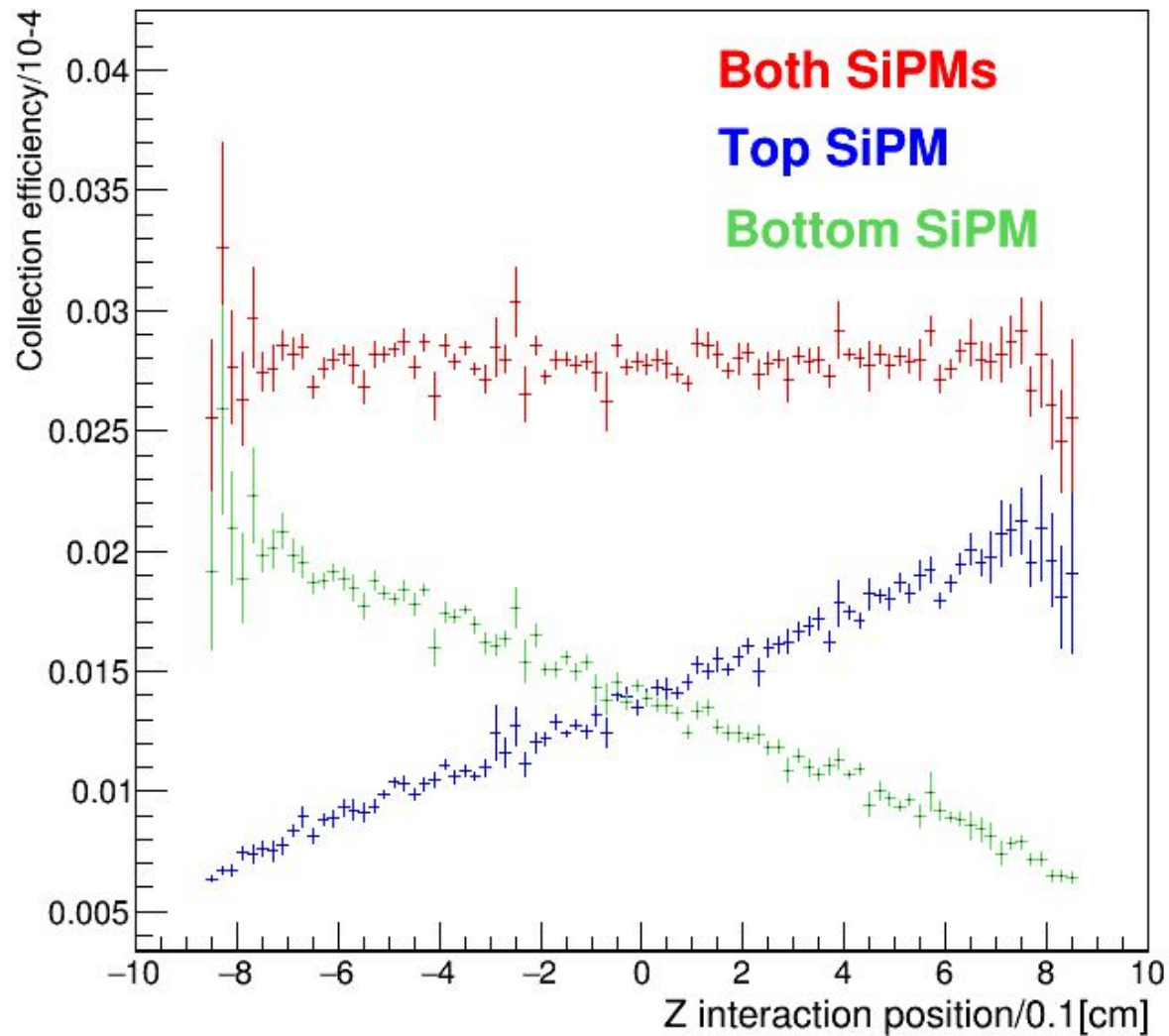


Collection efficiency

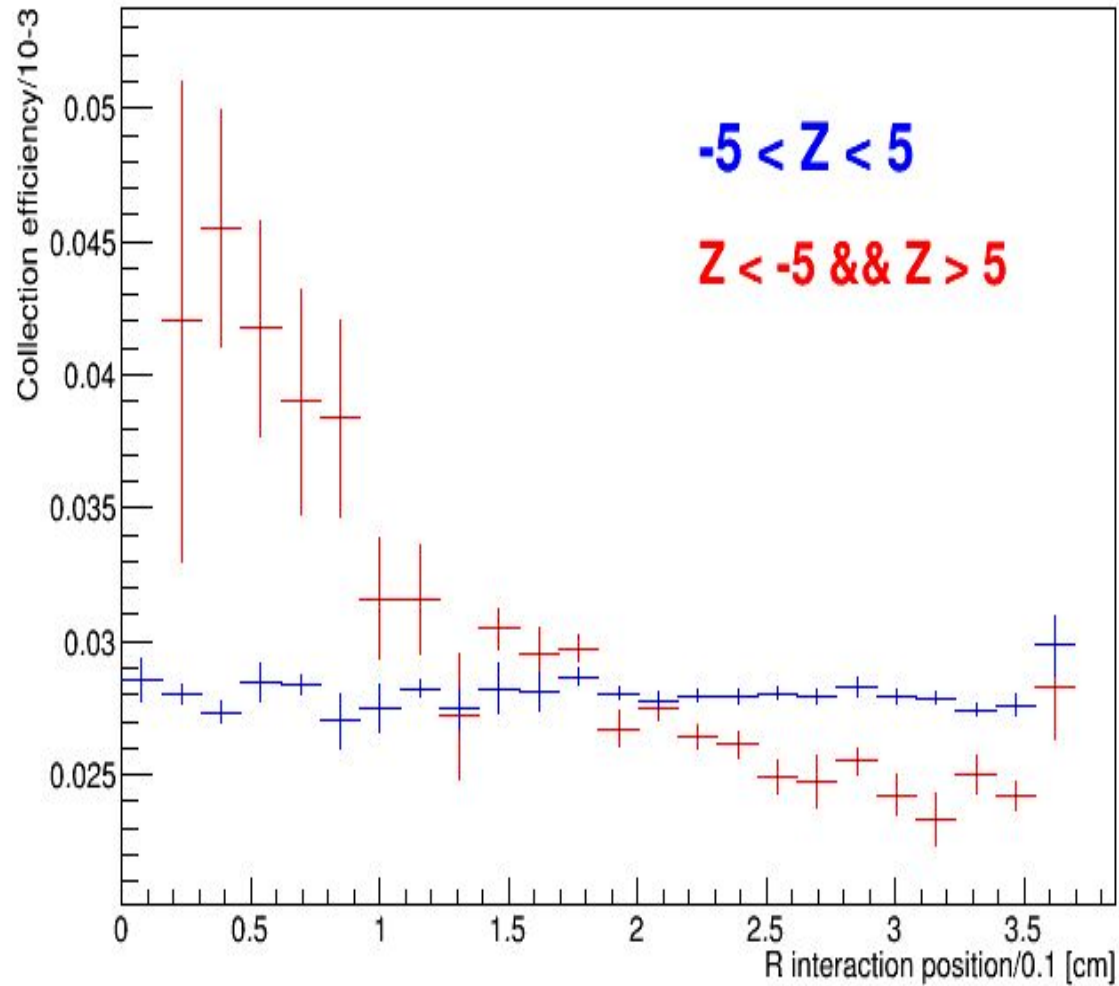


- Collection efficiency 3 % \rightarrow LY 0.6 PE/ keV (PDE 0.4)

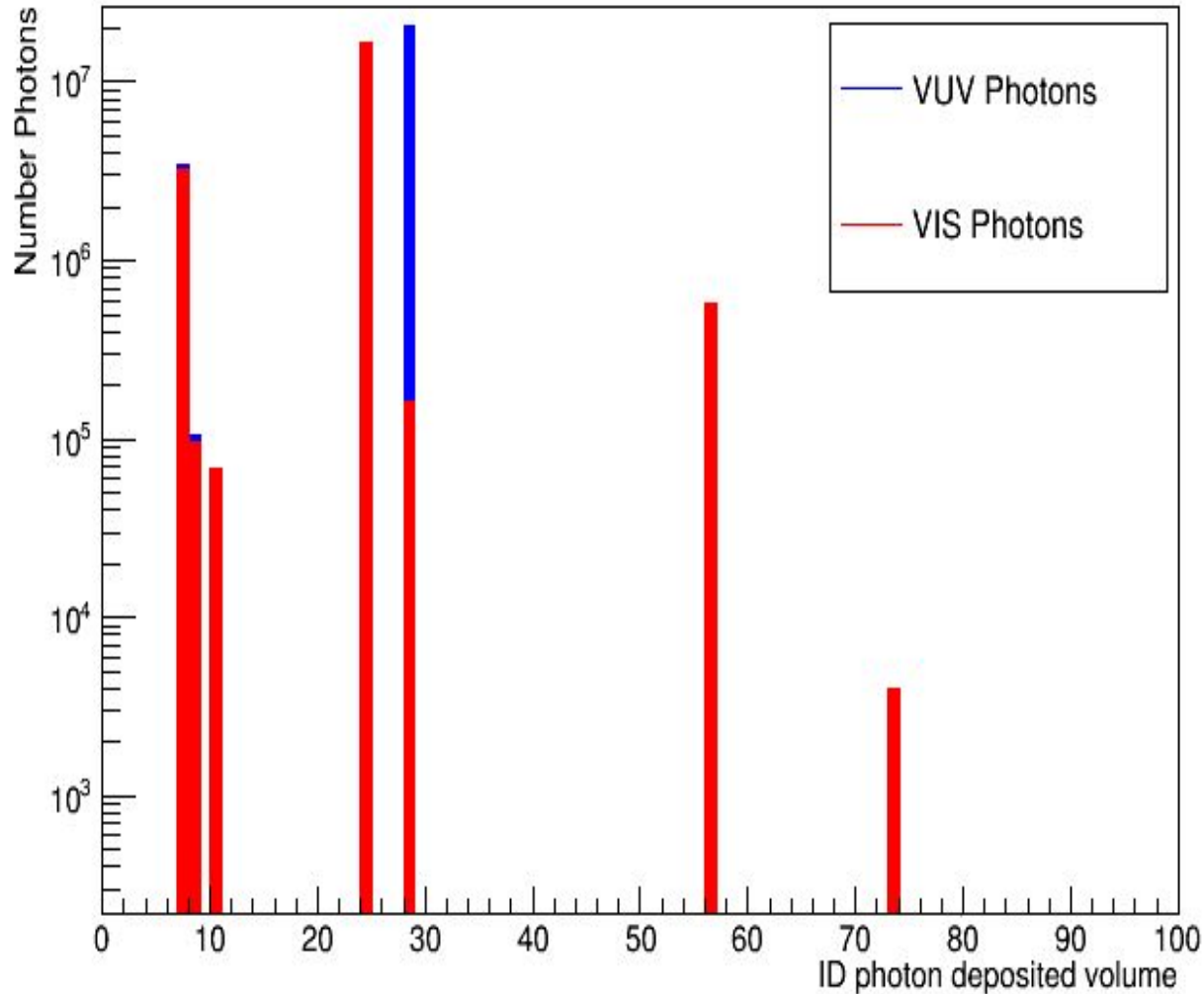
Collection uniformity



Collection uniformity



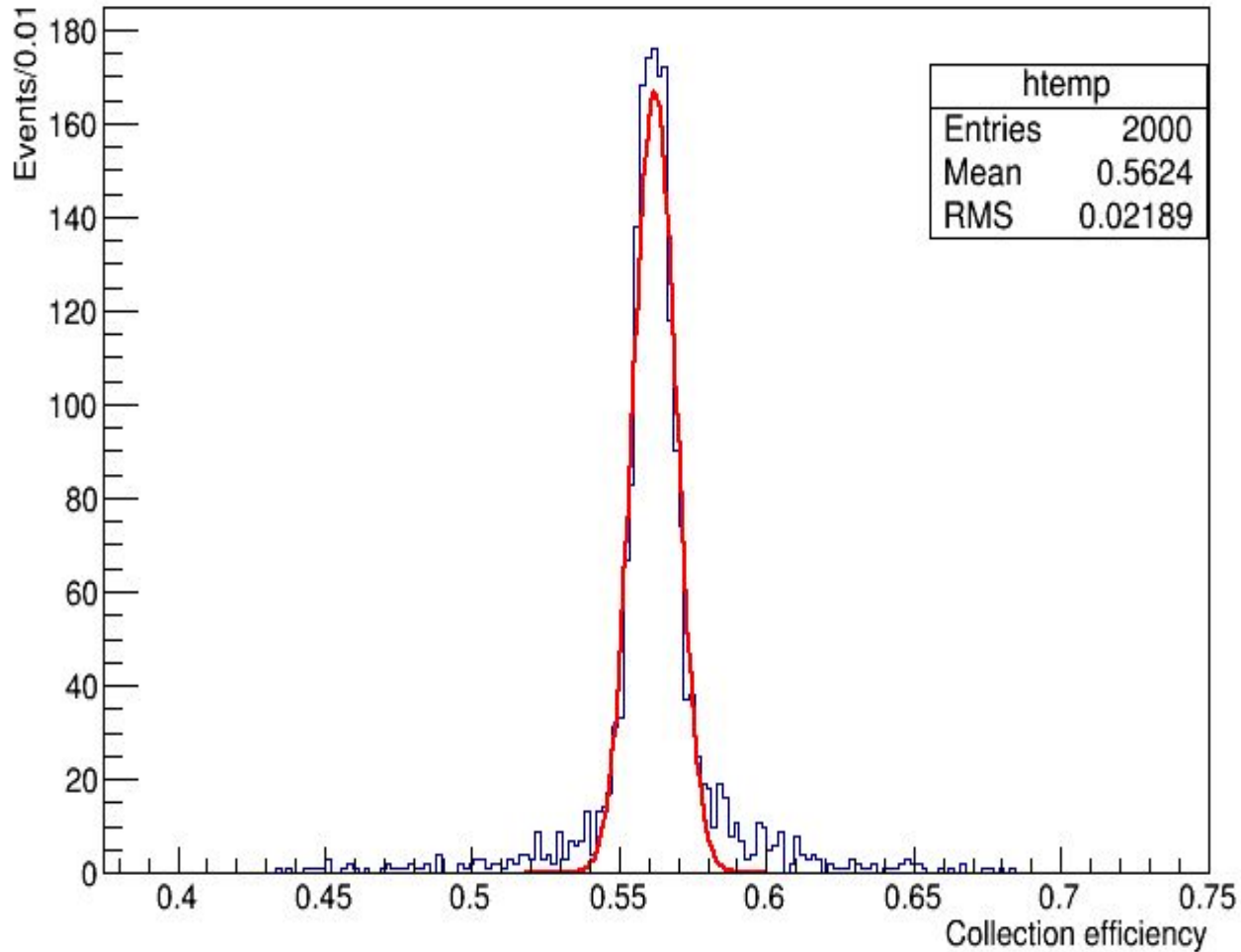
Deposited photon volumes



Deposited photon volumes

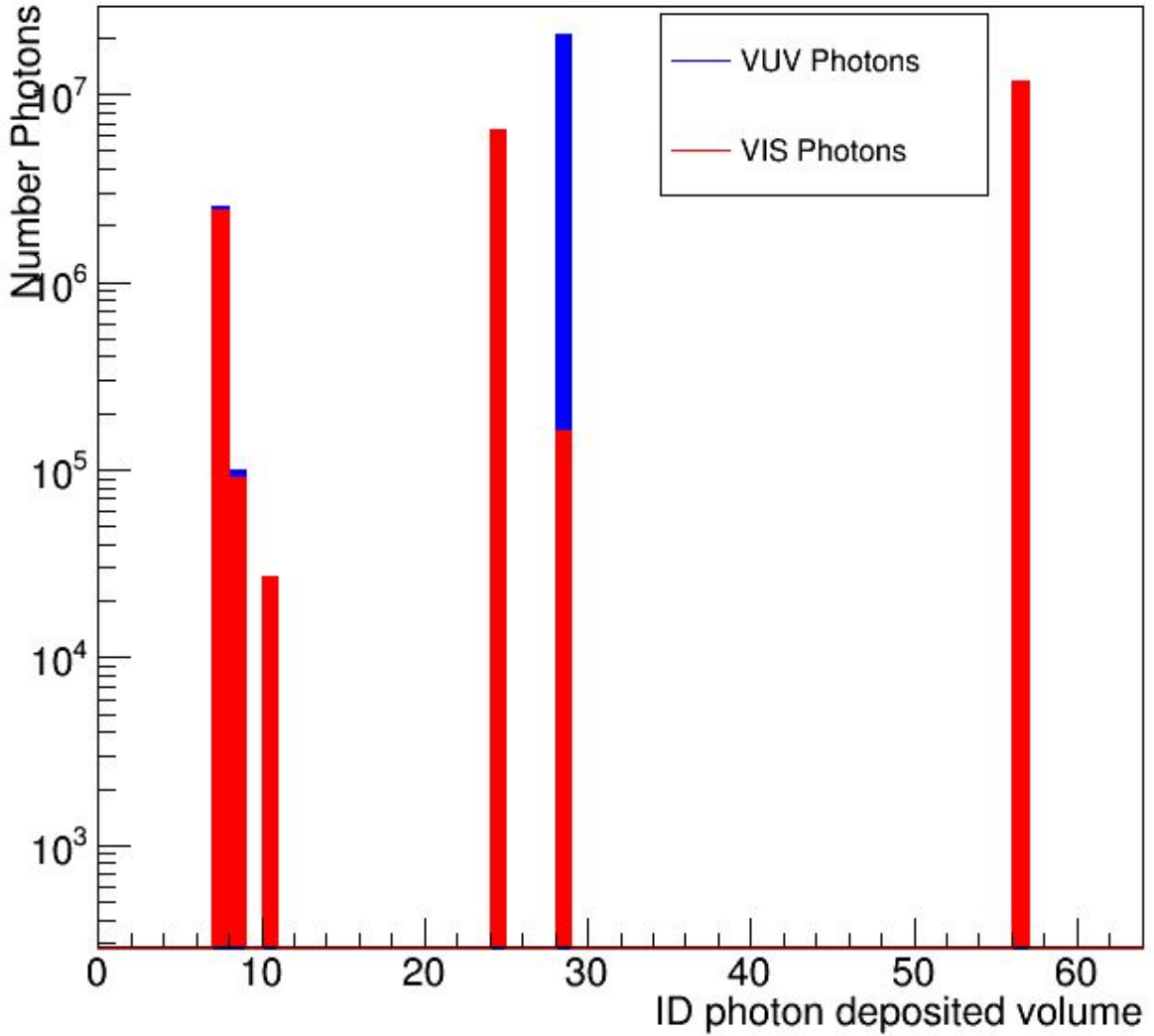
Volume	Percentage of VIS-photons absorbed [%]
SiPM	2.7
Acrylic (inner cylinder)	10.3
Outside active volume (copper, acrylic, inactive argon)	83.2
Other (TPB, active argon, PCB)	3.8

Collection efficiency 25 cm²



- Collection efficiency 56 % → LY 11.5 PE/ keV (PDE 0.4)

Photon volumes 25 cm²



Photon volumes 25 cm²

Volume	Percentage of VIS-photons absorbed [%]
SiPM	55.9
Acrylic (inner cylinder)	9.7
Outside active volume (copper, acrylic, inactive argon)	31.0
Other (TPB, active argon, PCB)	3.4