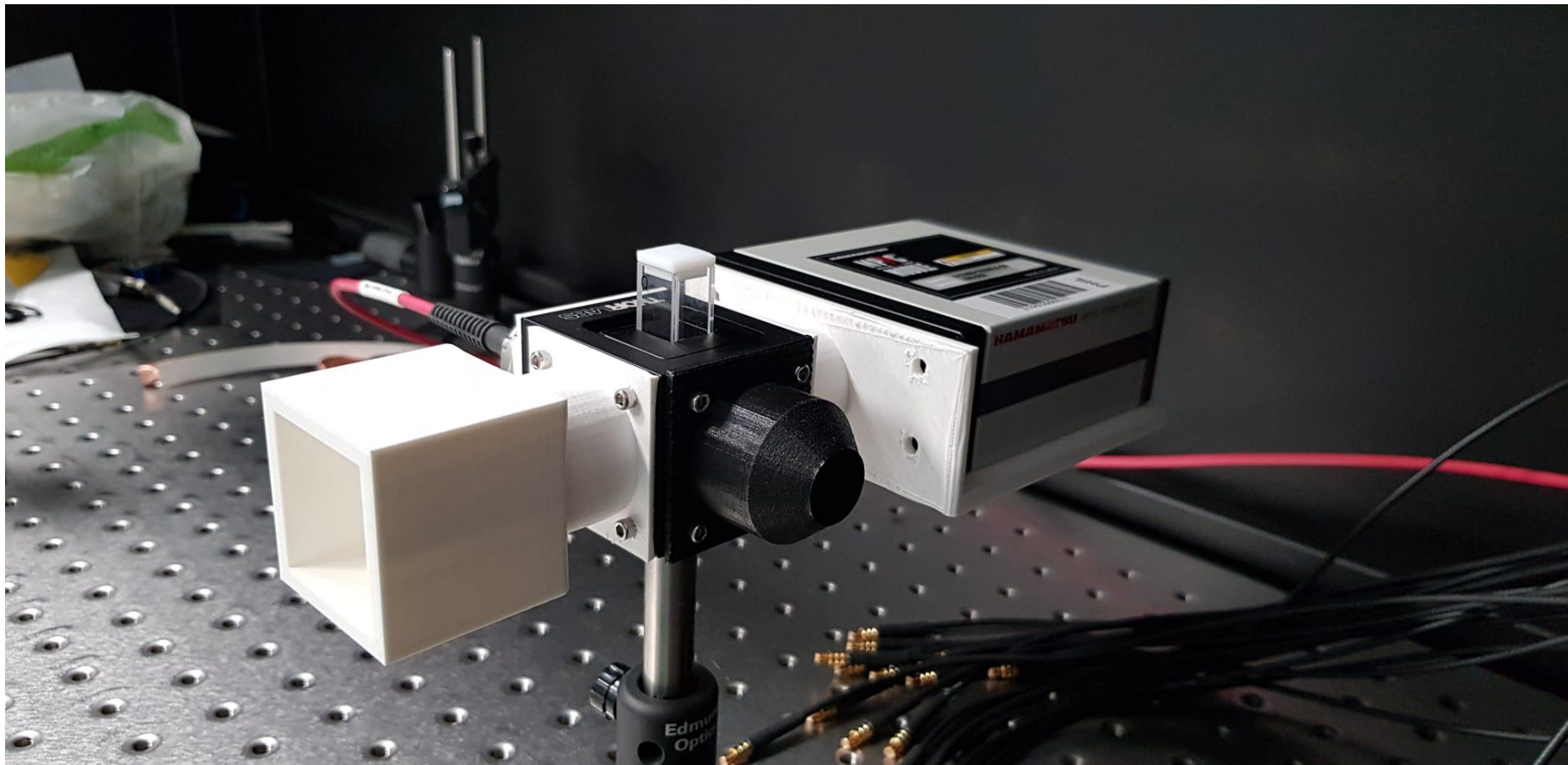


Dichroic & WLS

Jordi & Julio

CONSIDERATIONS

- Construct a **robust** but at the same time **versatile** setup to be used in both **dichroic & WLS** measurements with no major changes among them.
- Set-Up based on a 3D printed box with holes for the INPUT and OUTPUTS.
- Be able to **scan a filter or WLS** plate in all its surface inside the 3D printed box.
- Versatility to couple **PMT's, SiPMs or Integrating Sphere** at each of the outputs.
- Based on a previous design that reported very good energy resolution and single photon detection (smaller size)



TOP VIEW

OUT

MAIN IDEA

Rotating along post axis

OUT

OUT

MC

Width is given by $2 \times \text{Size of the PMT support}$ ($2 \times 8\text{cm} = 16\text{ cm}$) + size of the box (22 cm) $\rightarrow 40\text{ cm}$

Fixed at a Y position
Moving in the whole X,Z

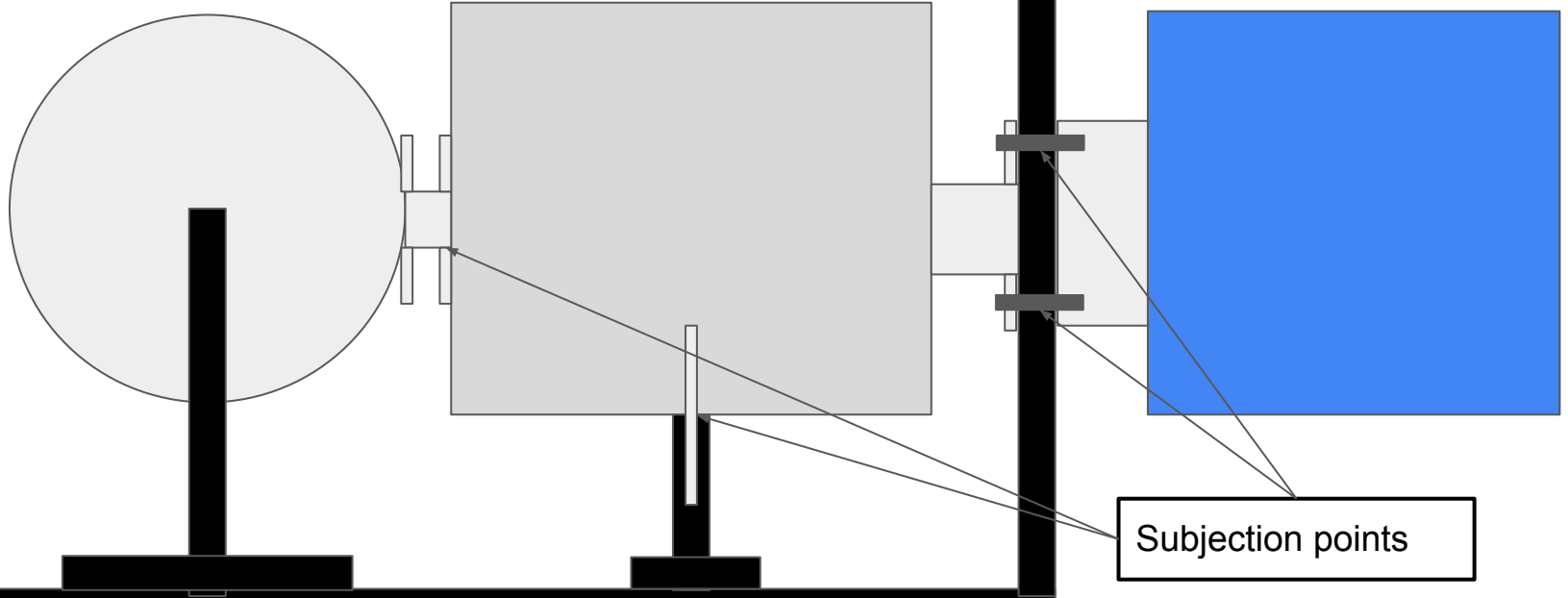
FRONT VIEW

Filter

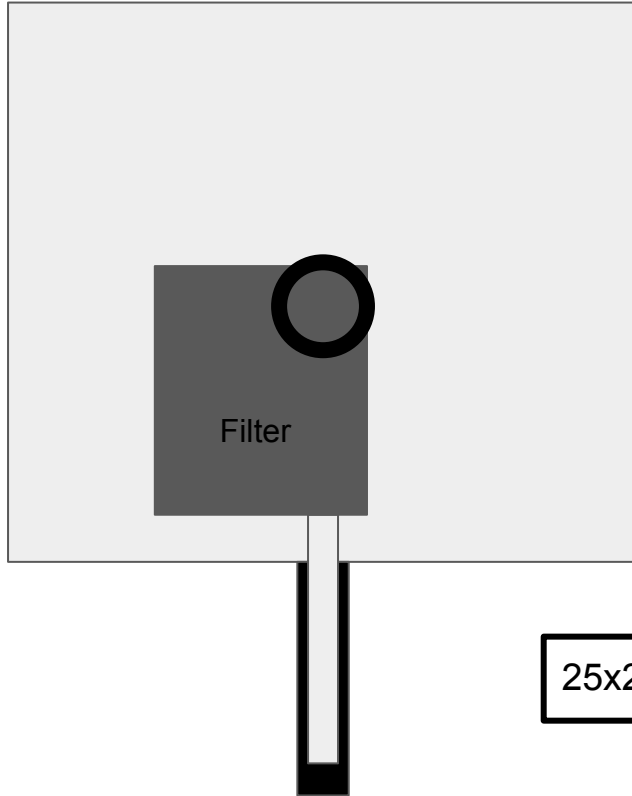
Filter support

Black post must adjust to the height of the box

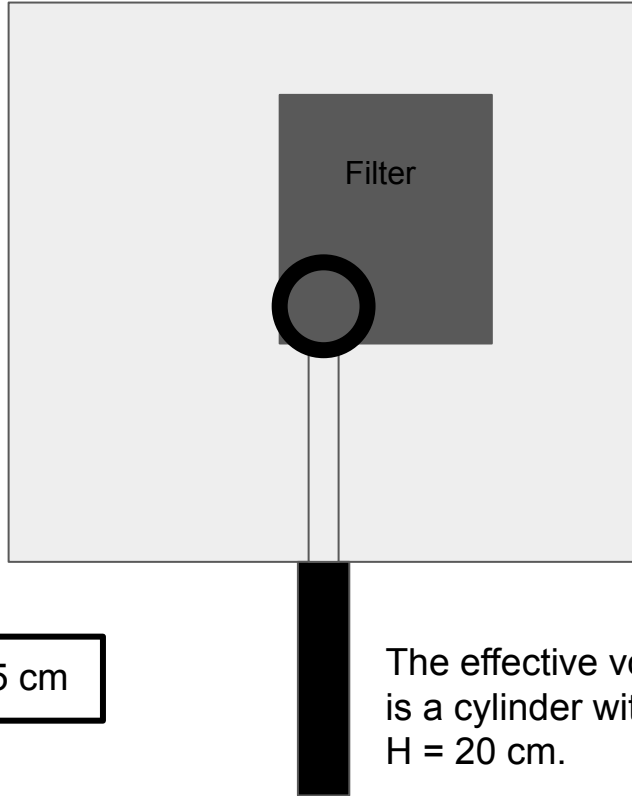
Height given by the height of the selected post
(5 cm) + height of the goniometer (2 cm) +
height of the box (22 cm) -> 30 cm



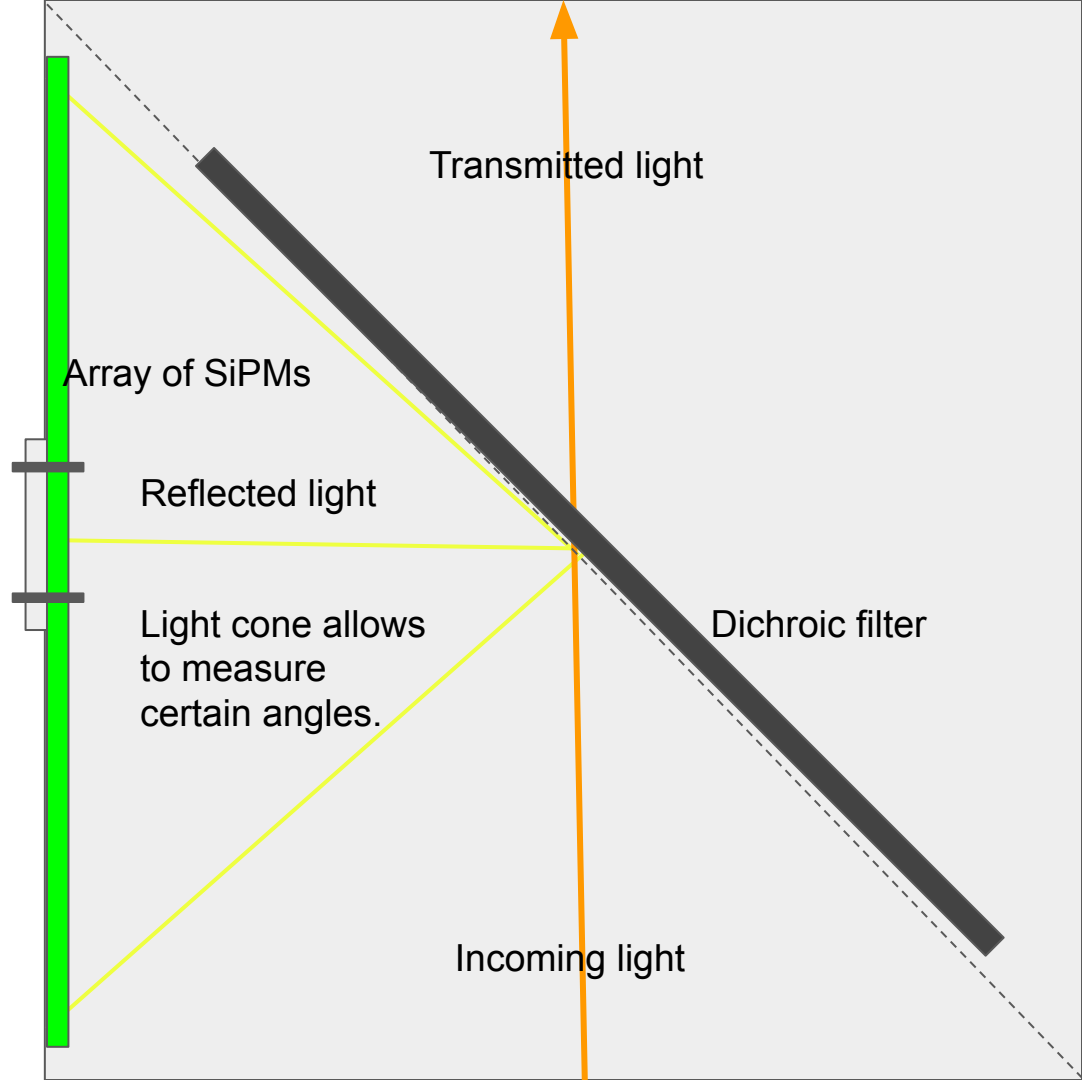
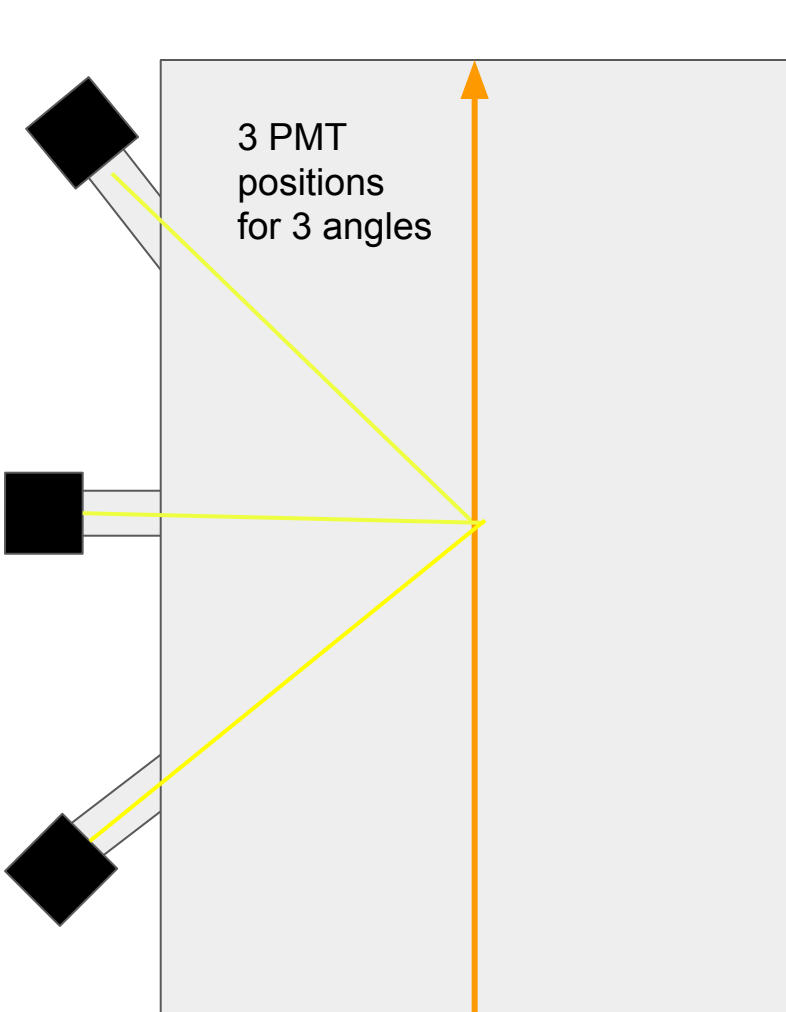
Dimensions of the BOX -> Allow the filter to cover all positions.

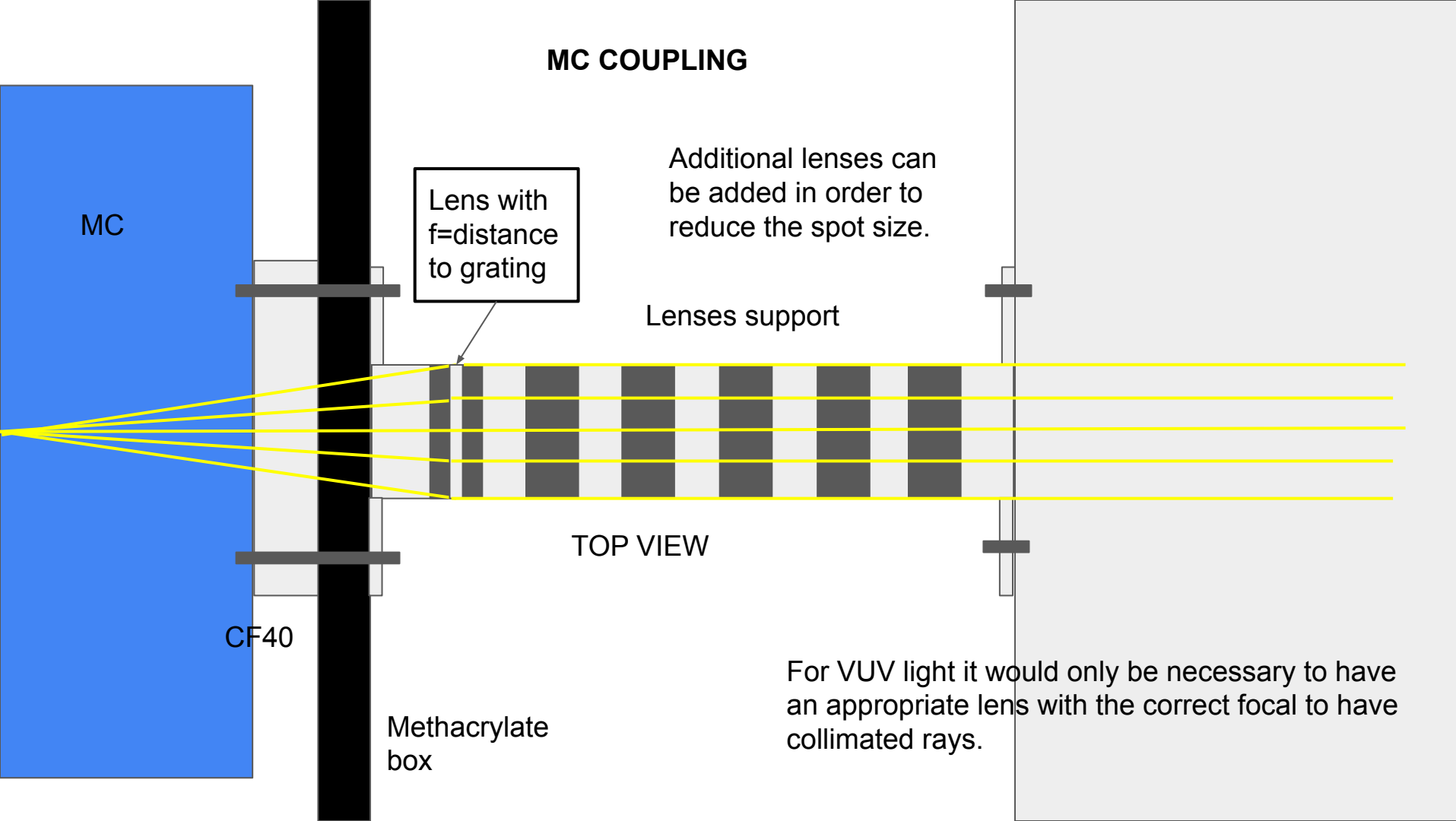


25x25x25 cm



The effective volume of the filter is a cylinder with $R=10$ cm and $H = 20$ cm.



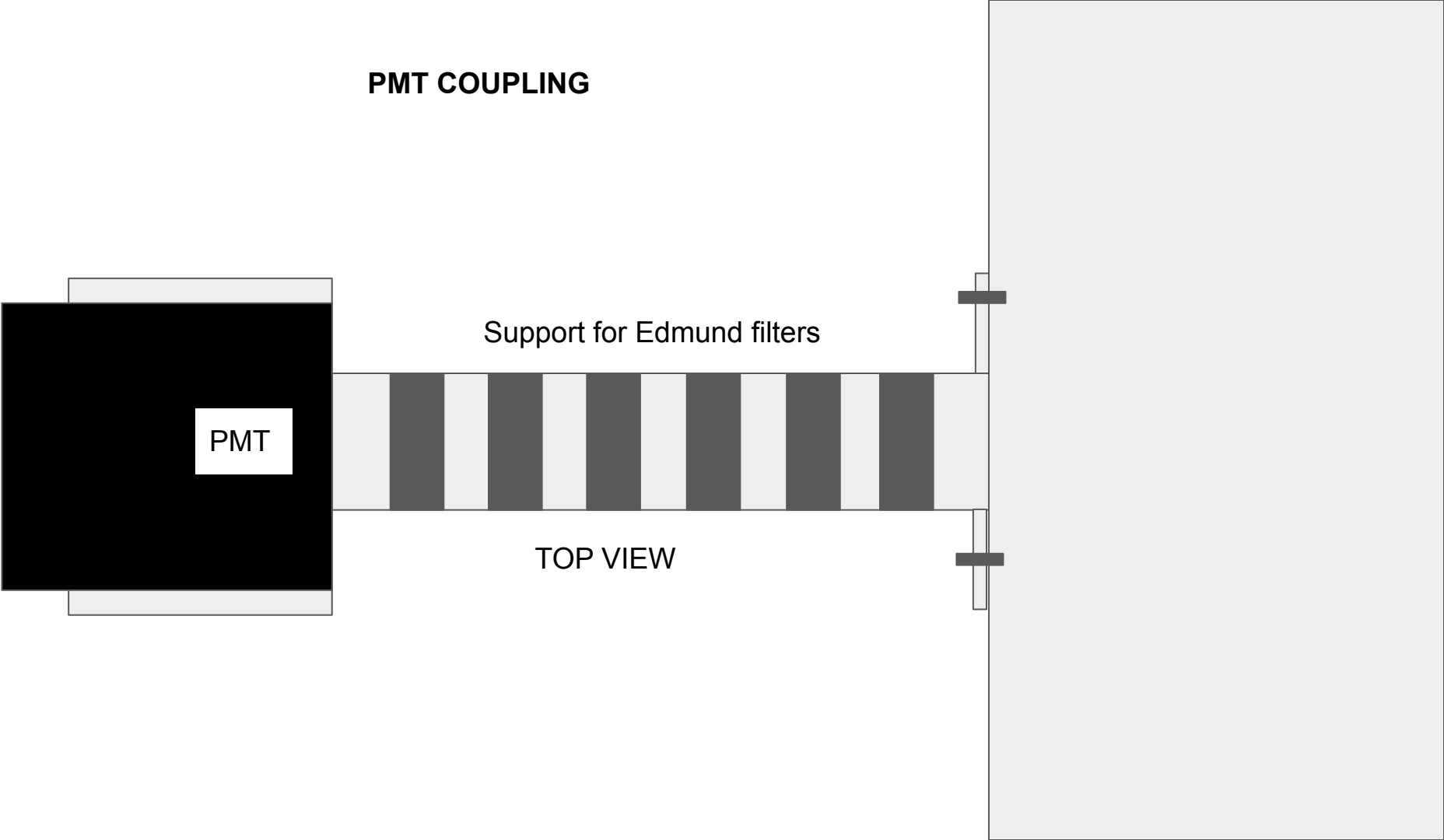


PMT COUPLING

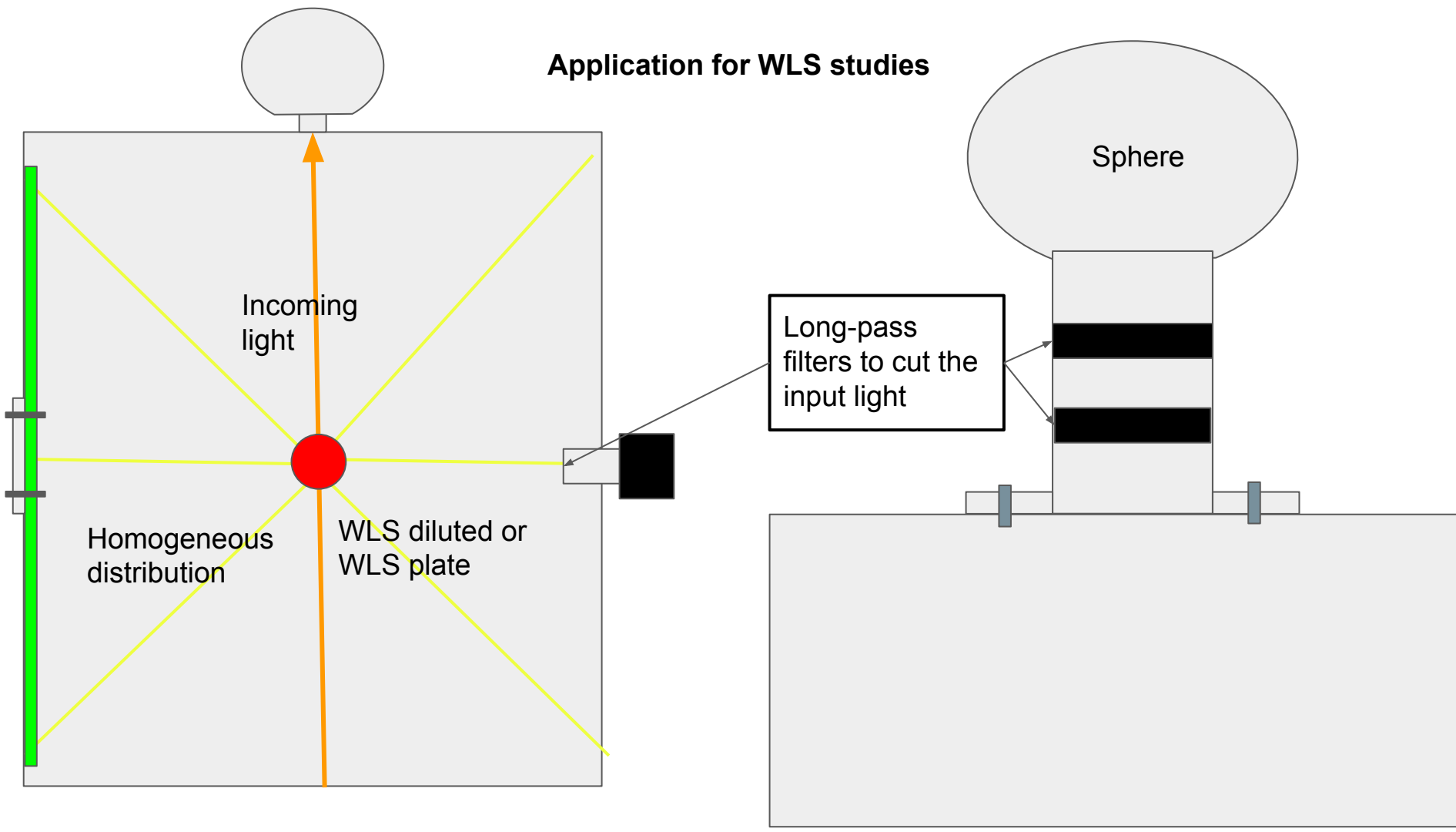
Support for Edmund filters

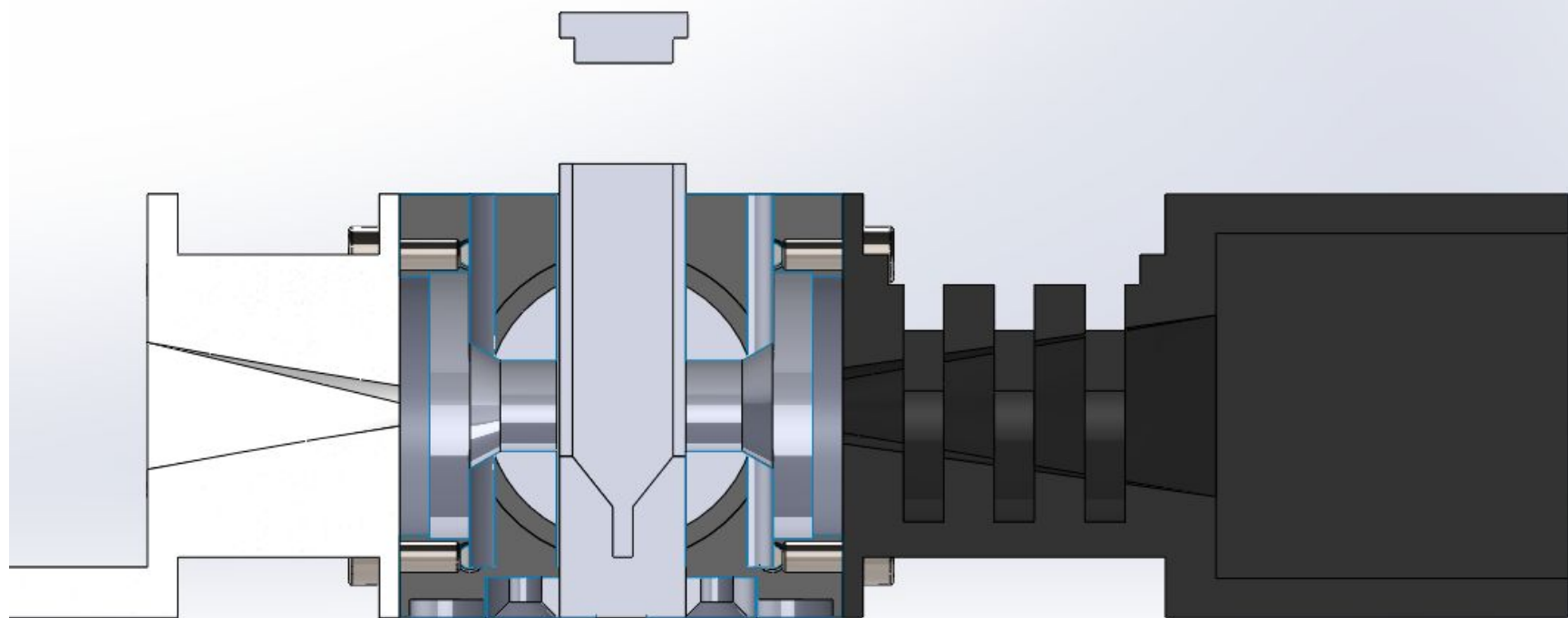
PMT

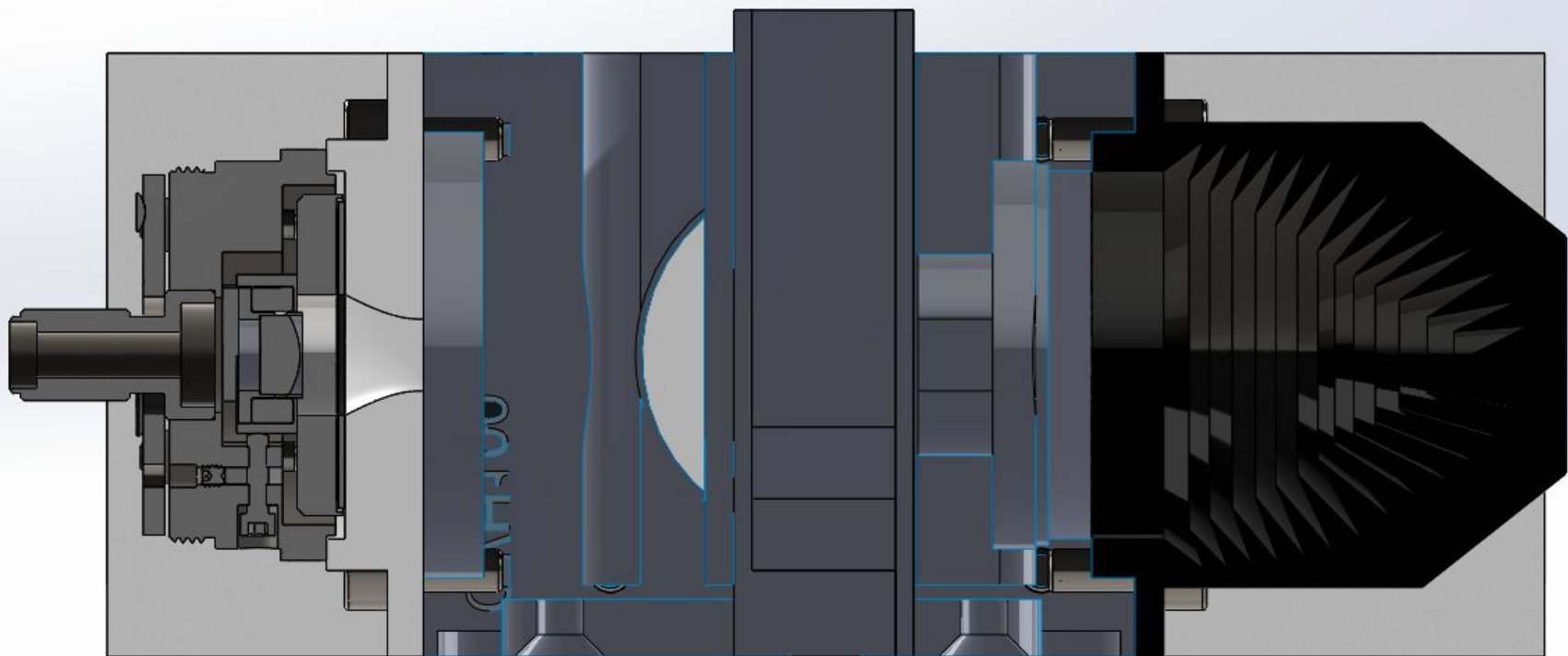
TOP VIEW



Application for WLS studies







Pros

- If properly constructed, no alignment problems among sources and detectors.
- Very robust and stable, keeping distances to all detectors always constant is one of the basic considerations.
- Good removal of potential sources of contamination from outside (important for WLS studies)
- Versatile in terms of adding filters and lenses; no need of more elements from ThorLabs to support lenses.
- Allows to get both transmitted and reflected light at several angles -> Best constraints.
- Can work (in principle) in a N₂ atmosphere.
- Cheap in terms of material consumption.

Cons

- Probably difficult to manage with the gloves of the methacrylate box (depending on construction).
- Need to design and print an important number of pieces.
- Need to be built very carefully in order to have all detectors at the same XZ plane (specially if SiPMs are installed) to have good alignment.
- Need to instrument several ports for the feeding and signal reading of different elements (specially SiPMs).
- Still need at least one lens working for VUV light.