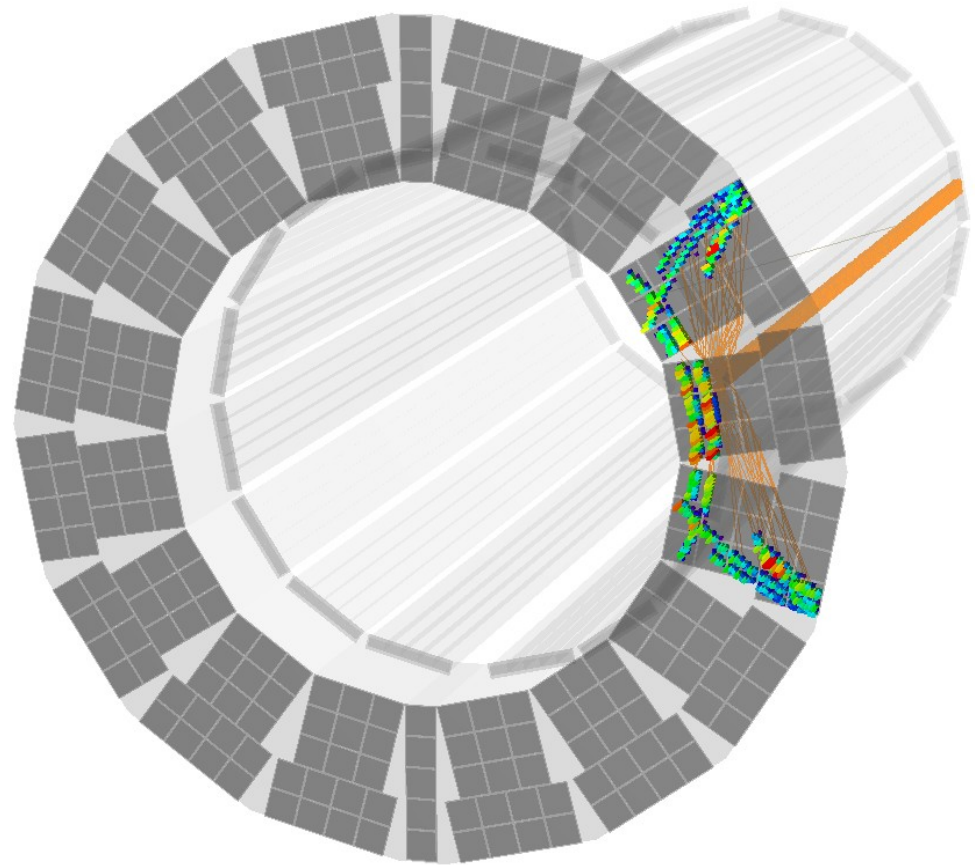
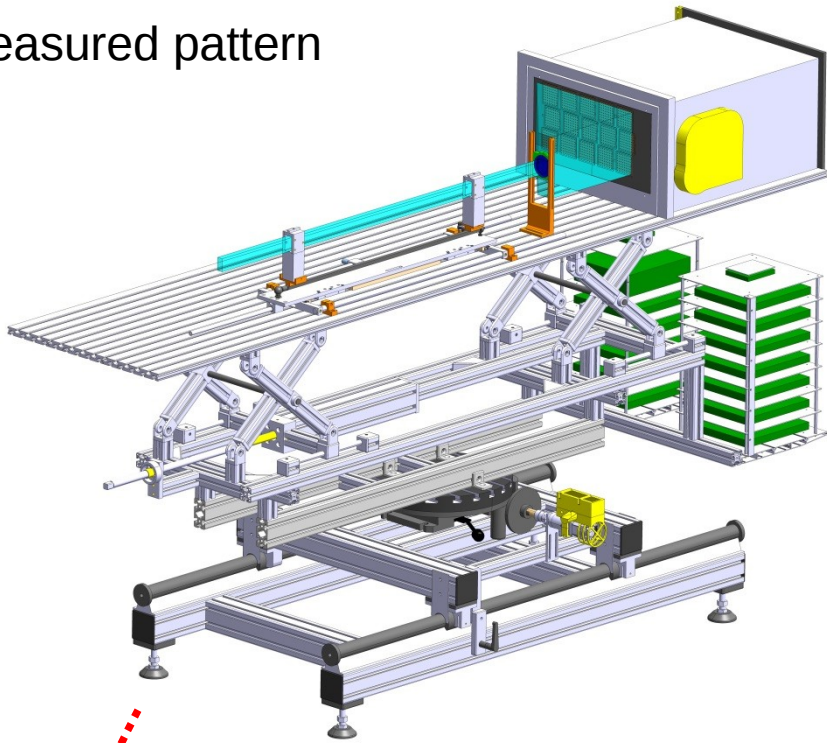


Next focusing lens for the Barrel DIRC

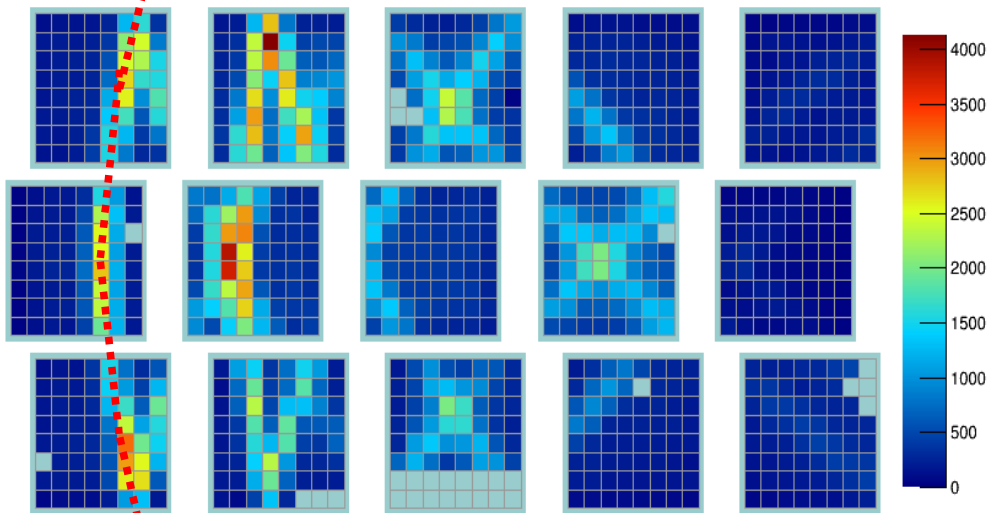
Carsten Schwarz, GSI



Measured pattern



view from back

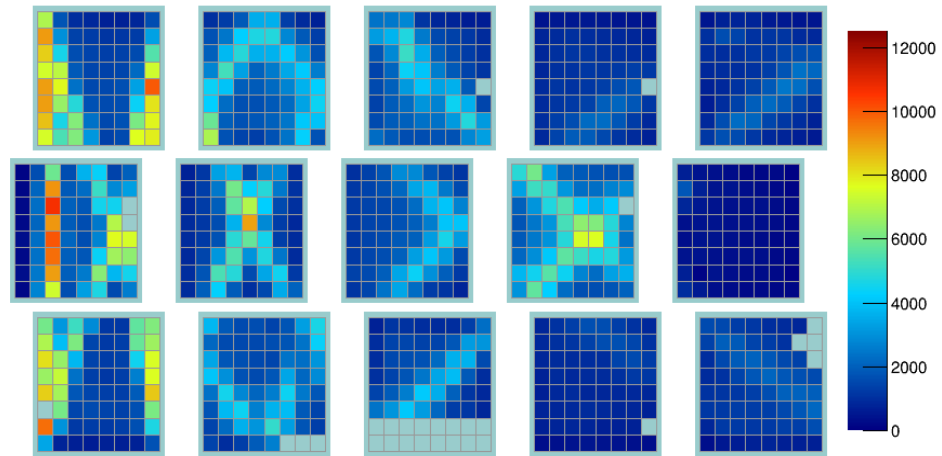


$p, 3 \text{ GeV}/c$

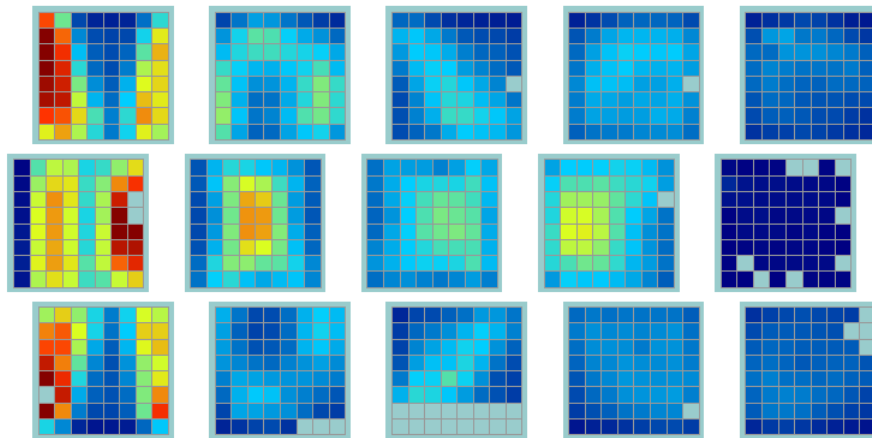
Observed Cherenkov rings are folded

Don't forget the lens...

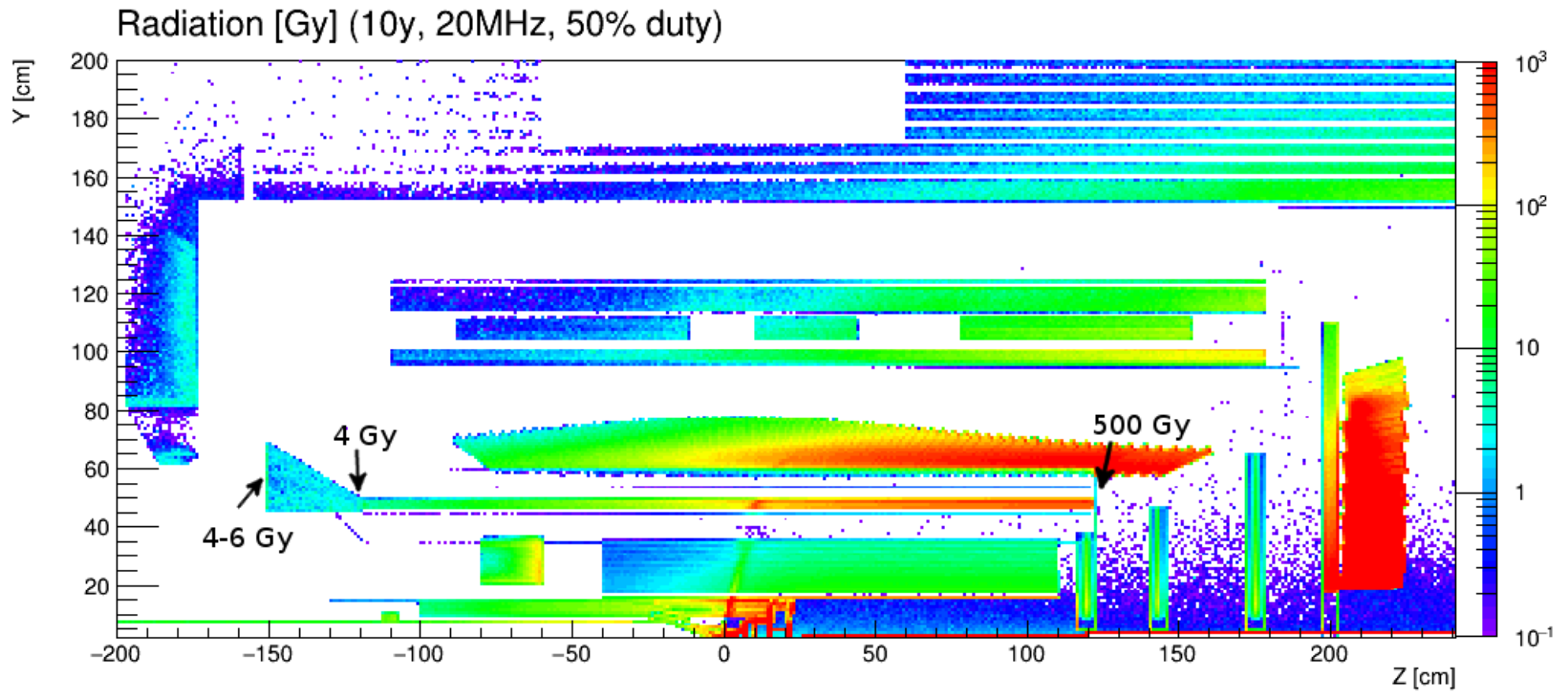
hit pattern for 3-layer lens
7 GeV/c, 50 degree



no lens



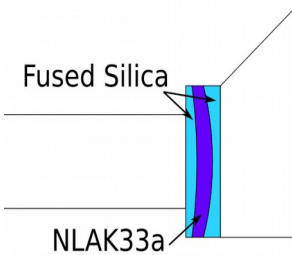
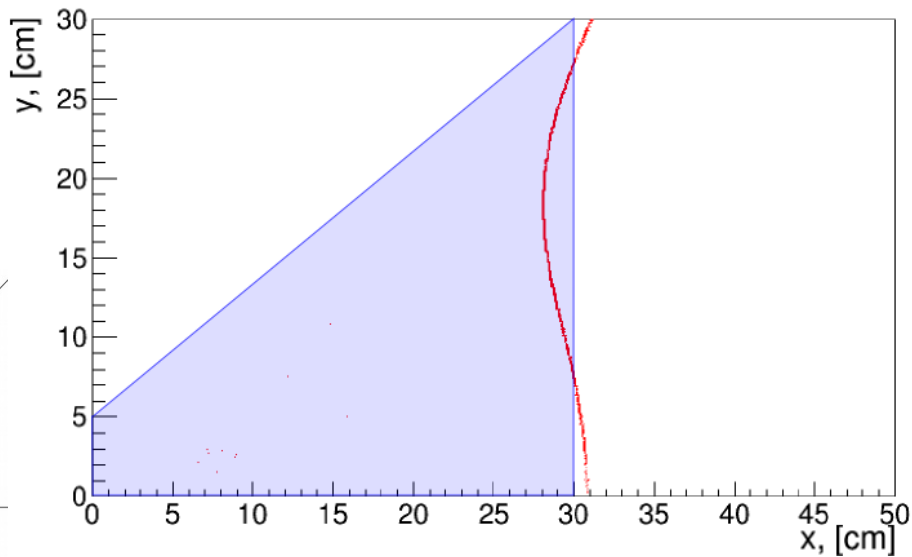
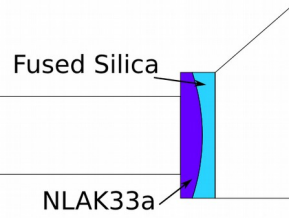
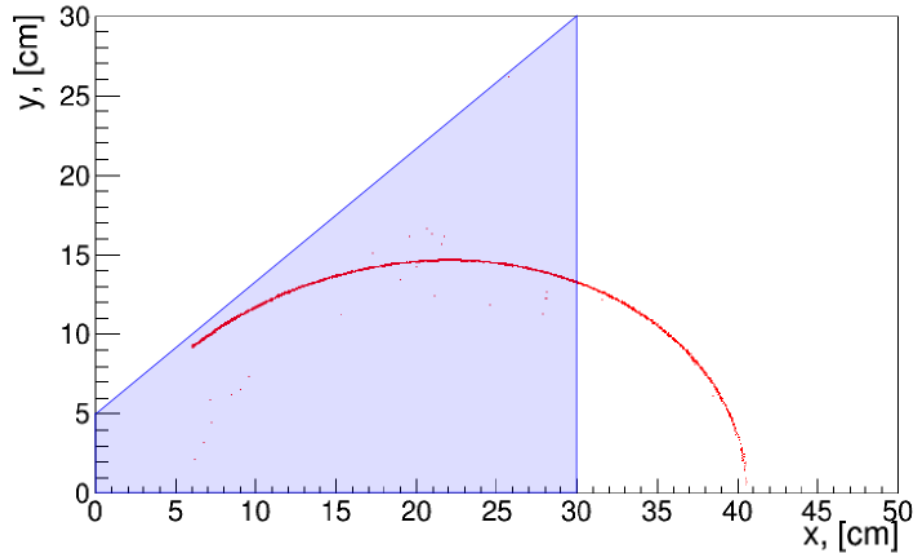
Radiation hardness



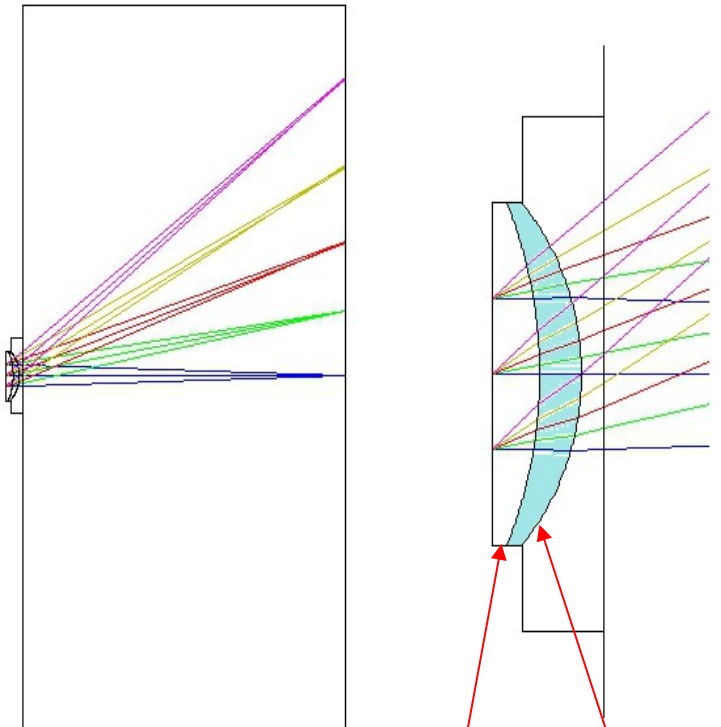
DPM background generator

Optical software: Spherical lens

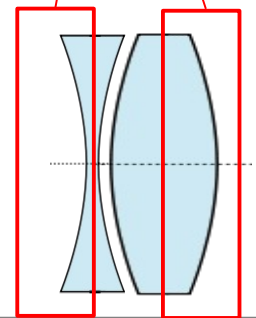
Geant



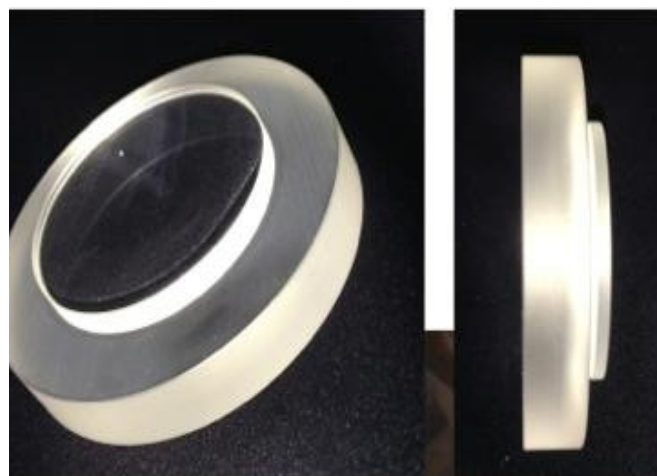
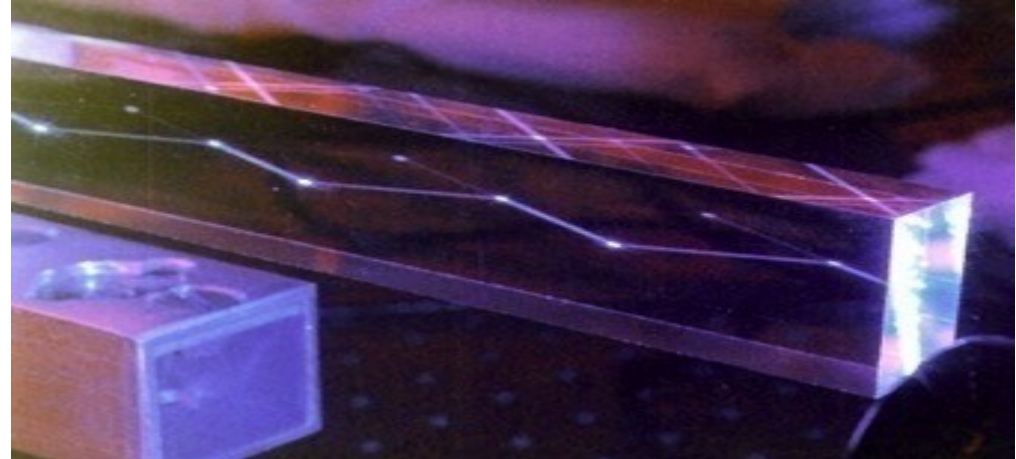
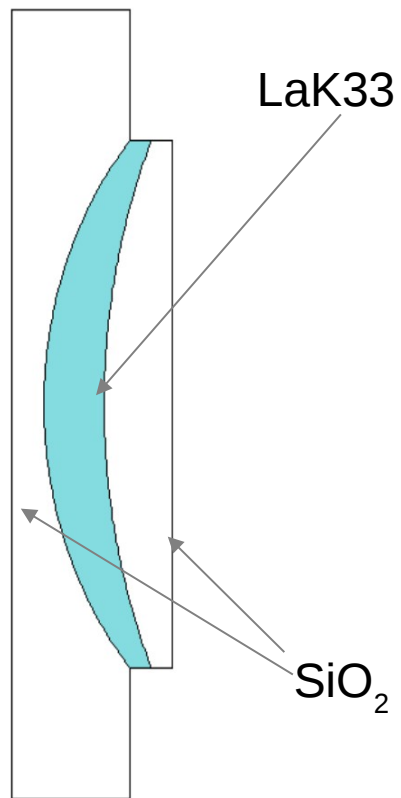
Zemax



Dispersing +
focusing lens
for flat focal plane



Lens design aimed for a focal plane matching the flat photon detector plane



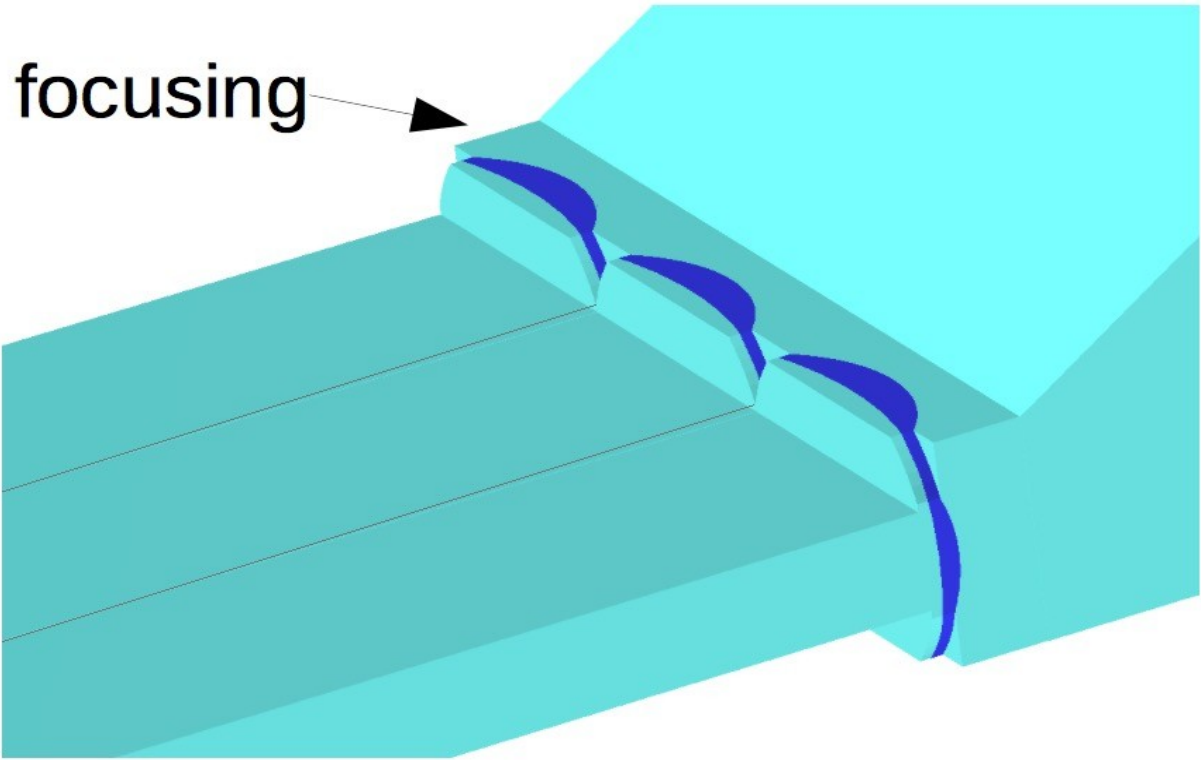
Radiation level ~ 400 Rad
(CUA 1% / 100Rad @420nm x-ray)

PbF₂ is radiation hard, $\gamma \sim 100$ kR
Other optical radiation resistant glasses?

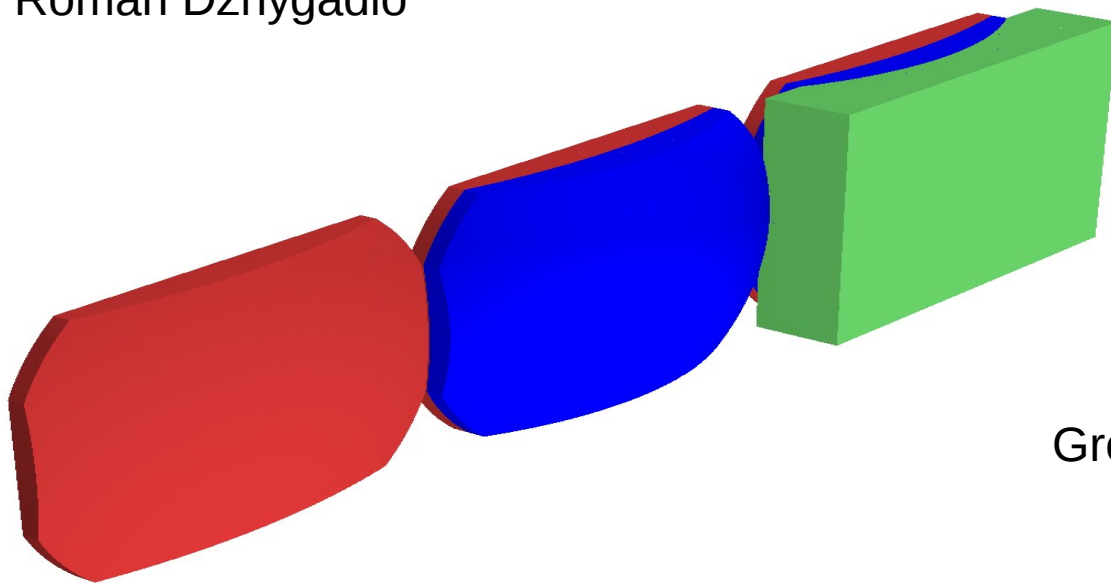
Important for EIC



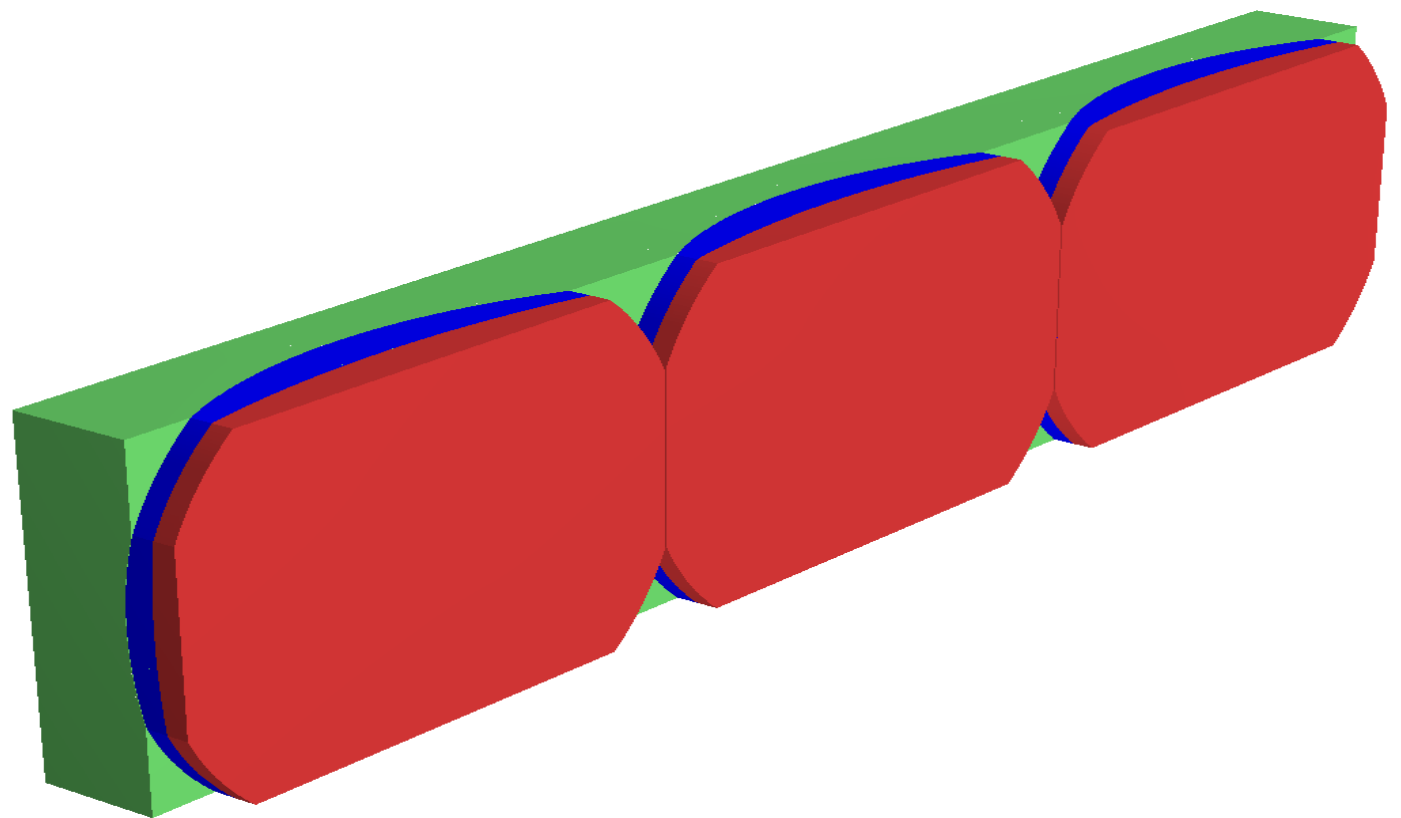
Barrel DIRC baseline design: three radiators per prism



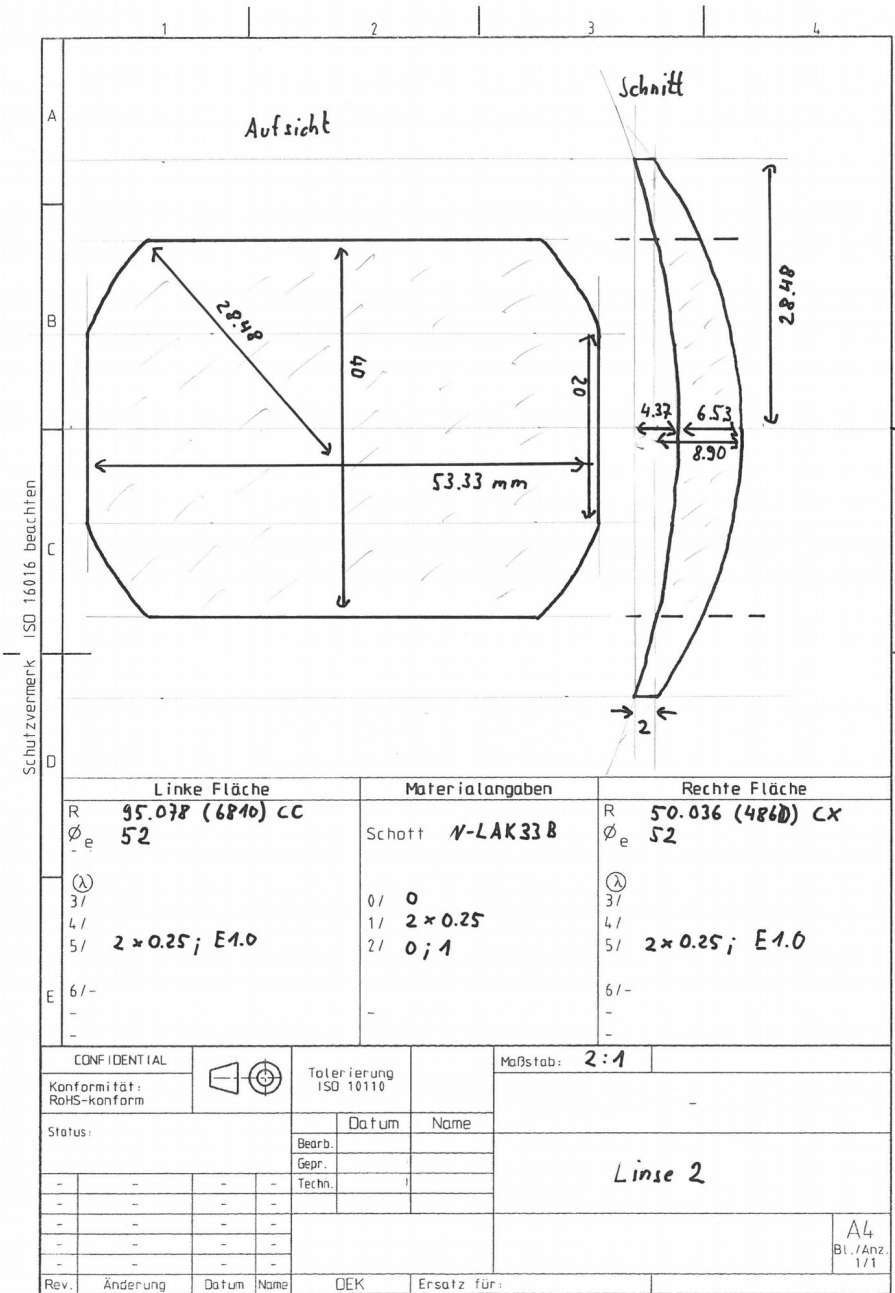
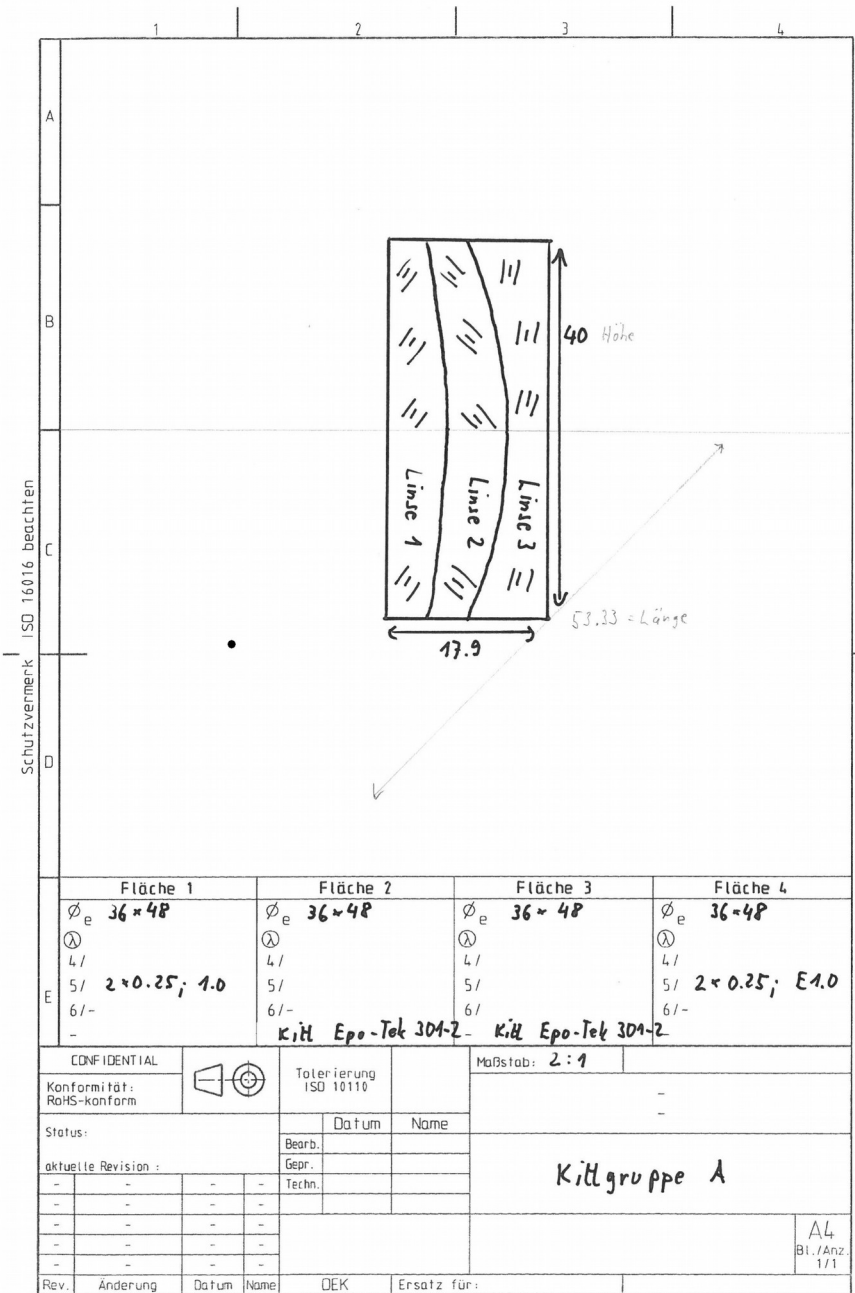
GEANT
Roman Dzhygadlo



Green: one solid piece of SiO₂ ?



Companies need drawings in accordance with ISO 10110



Summary

Several iteration of lenses

- Simple lens with air gap → too much photon loss
- Lens group: One bended surface → bended focal plane
- Lens group: Two bended surfaces → flat focal plane
- Lens group system: Lens combination (new, awaiting offer)
→ close to final version