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Stray light control

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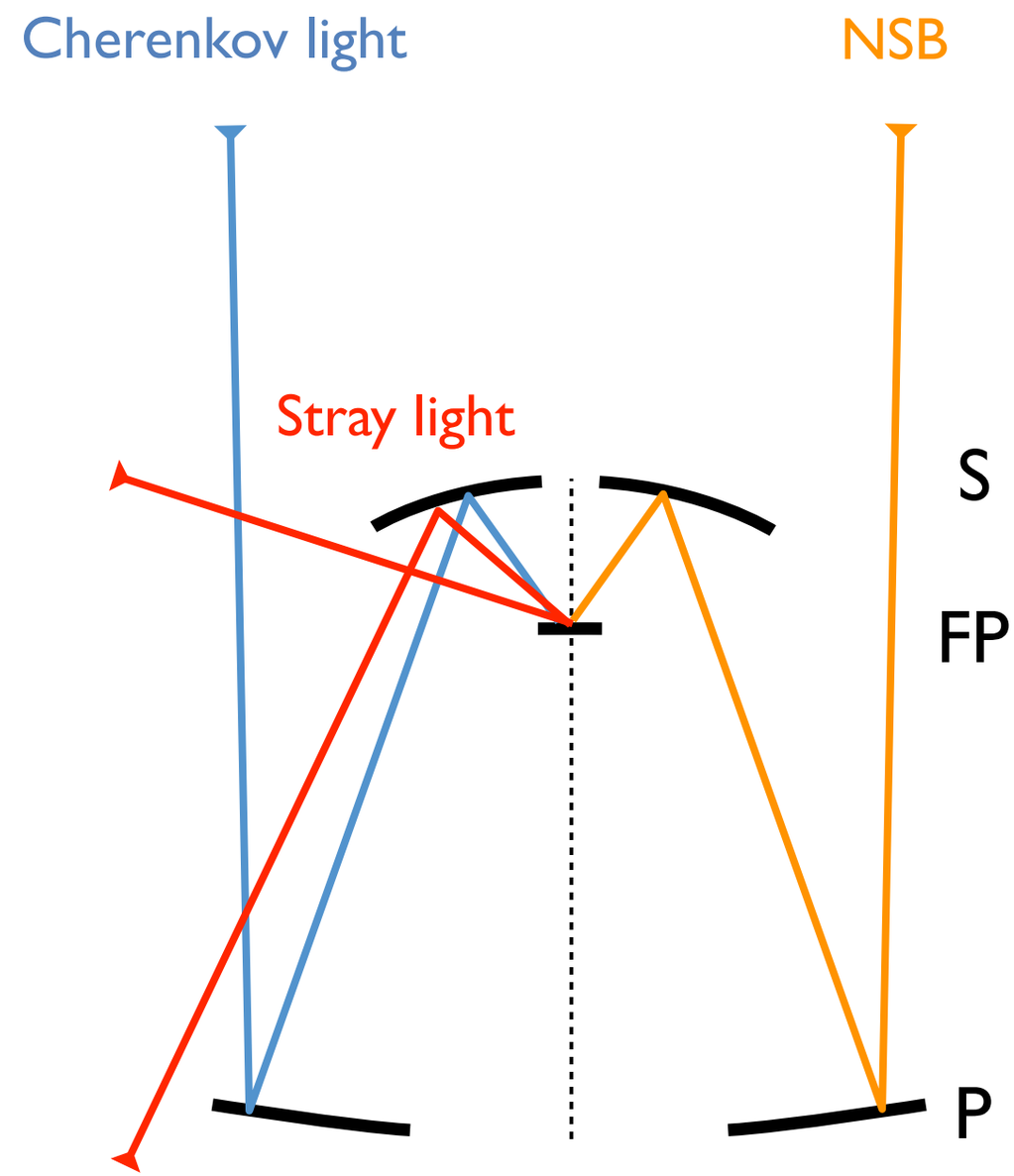
Stray light on SC optics

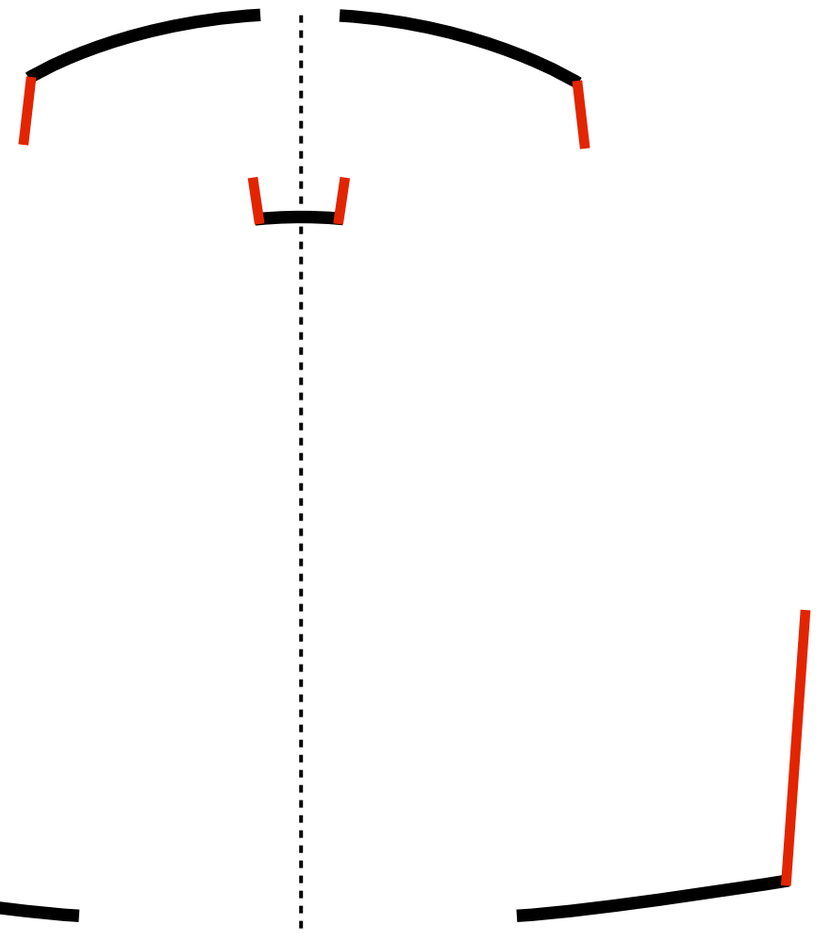
- The optical design of the SC telescope might collect more stray light than currently operating DC telescopes.

1. Simulate how much stray light the SC telescope is going to be collecting compared to NSB.
2. Explore different optical elements that can be added to the system to reduce stray light.
3. Come up with a final optimized solution.



Stray light control

- Baffles around primary mirror
  - Non-invasive
- Baffles around secondary mirror
- Baffles around focal plane



Stray light control

- Baffles around primary mirror
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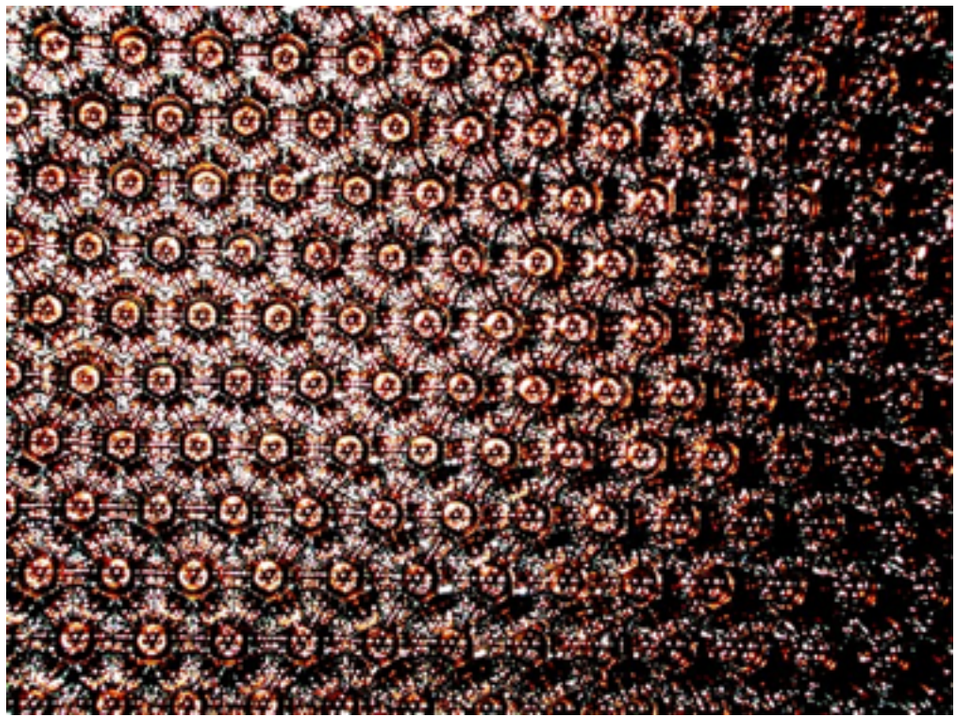
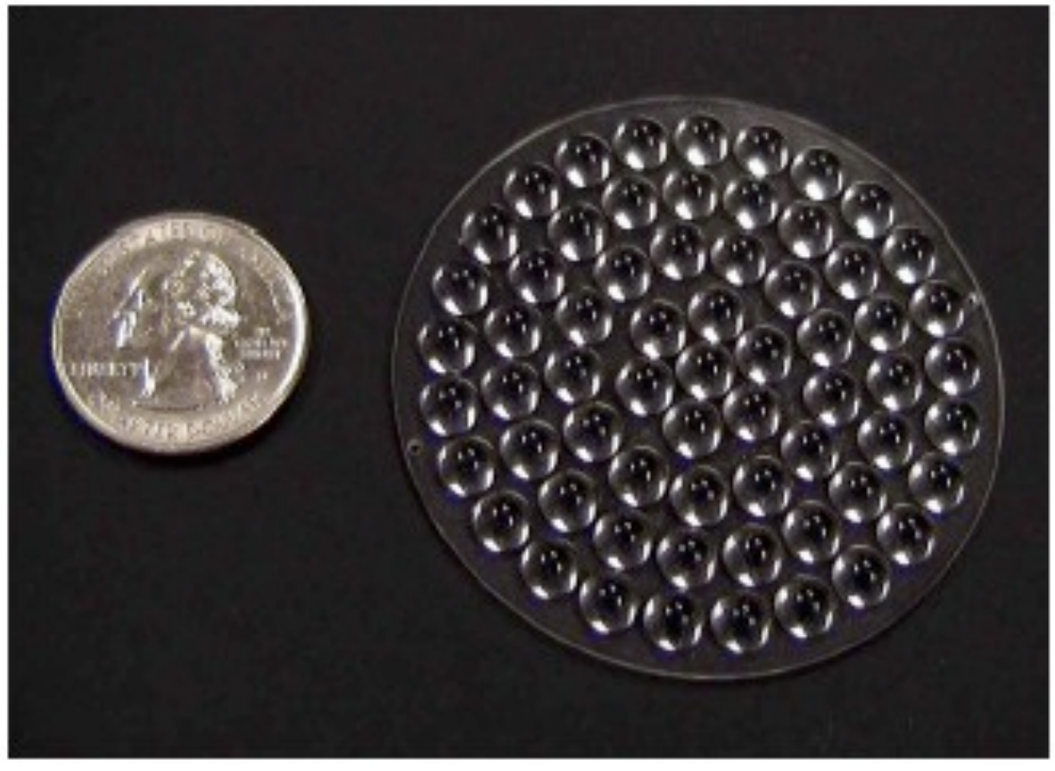
- Baffles around focal plane
- Reflective cone-like structures



Stray light control

- Baffles around primary mirror
  - Non-invasive
- Baffles around secondary mirror
- Baffles around focal plane
- Reflective cone-like structures
- UV-transparent plastic lenses
  - In addition to stray light reduction, lenses and cones could improve the acceptance of the focal plane to photons with large opening angles.



Optimization

- Test of different stray light control elements and optimization of geometries started with custom ray-tracing code (plan to switch to grOptics).
- Reduce Ω_{SL} / Ω_{FoV} to minimum tolerable levels. Minimum loss of FoV photons.
- Homogeneous amount of residual stray light along the focal plane (simplifies data analysis)
- Need some interaction with other working groups:

Angular acceptance of photosensors	Step function to θ~75deg (SCT-CAM, in-house measurements)
Angular distribution of incoming photons	Homogeneous (OBS-SOUTH)
Definition of the camera entrance window	Needs to be included (SCT-CAM)
Baffles: material, position, weight constraints	Will need to be considered (SCT-MECH)
Tolerable level of stray light, homogeneity	(Simulations and data management)

- Feedback (specifications/requirements) from other WPs is welcome.