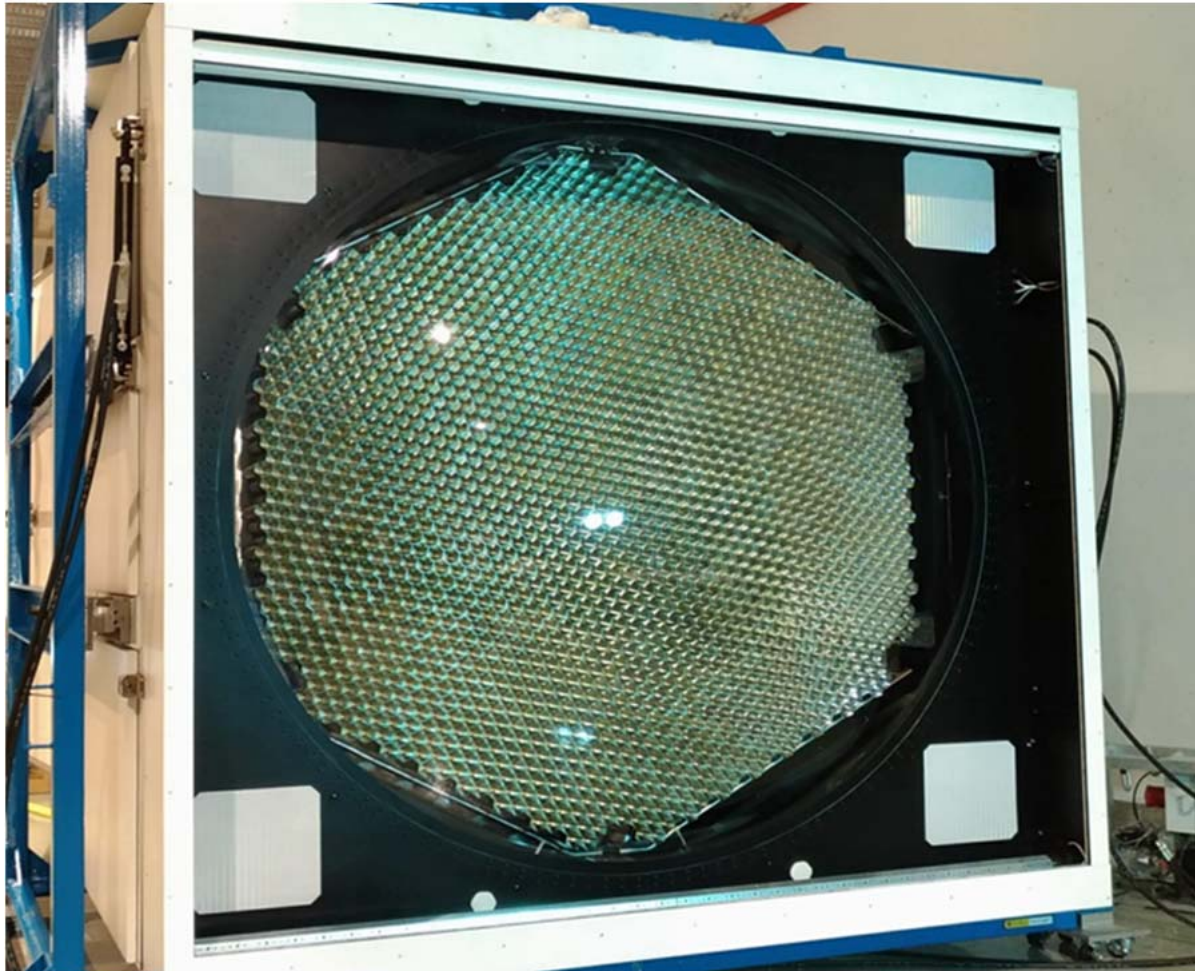


Light Guide for LST #1 camera finally completed.

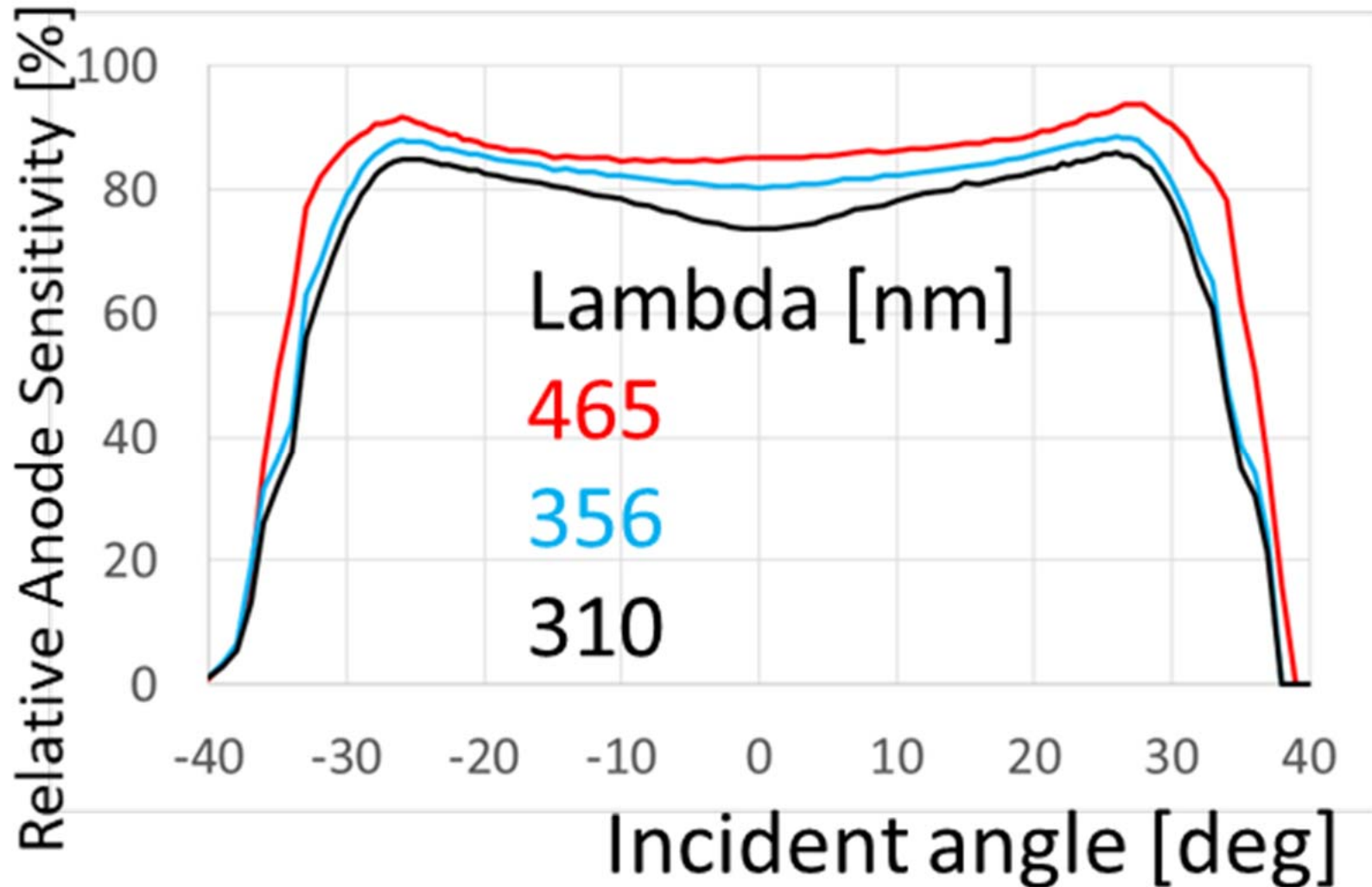


2018, Oct, 12 LST meeting in Lapalma Toko Yamamoto@Konan Univ.

Third generation Light Guide for LST. Tight and robust fixation of the aluminum plate



Wide FoV : cutoff angle is 28 degrees



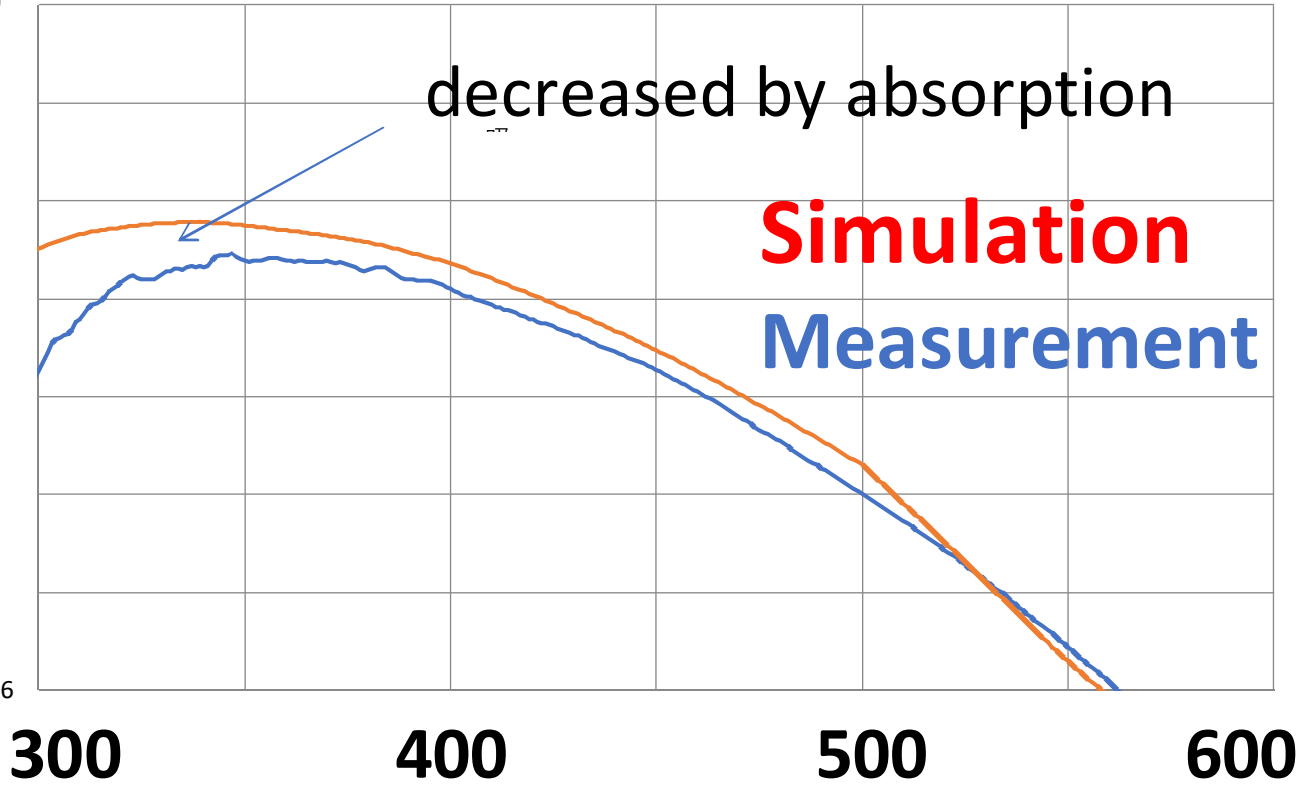
Blue enhanced coating

Reflectivity v.s. Wavelength

[%]
100

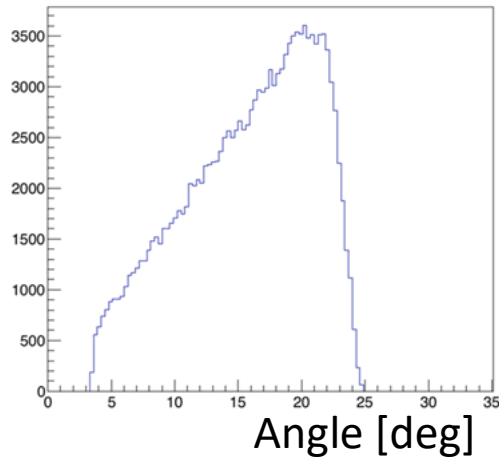
90

86

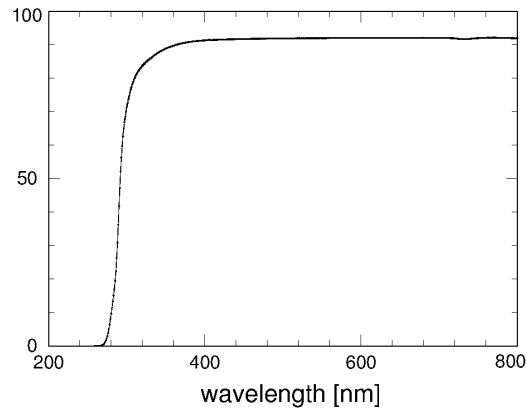


Light Collection Efficiency of the CAMERA of LST #1

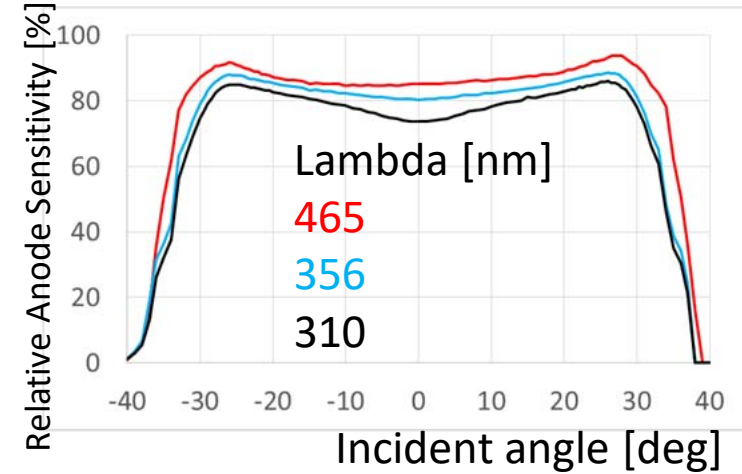
Incident Angle from Mirrors



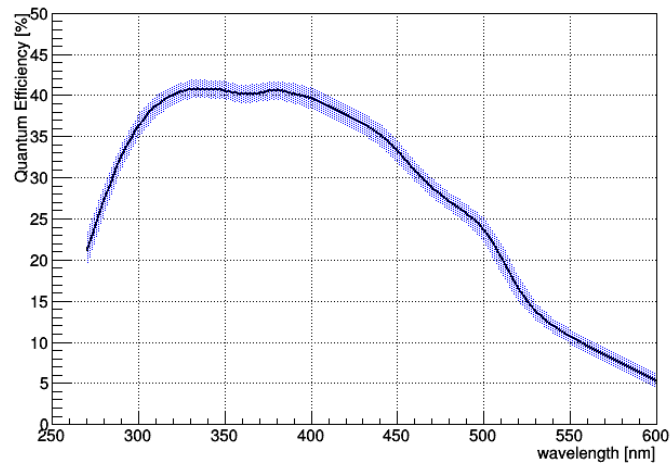
Window Transmittance



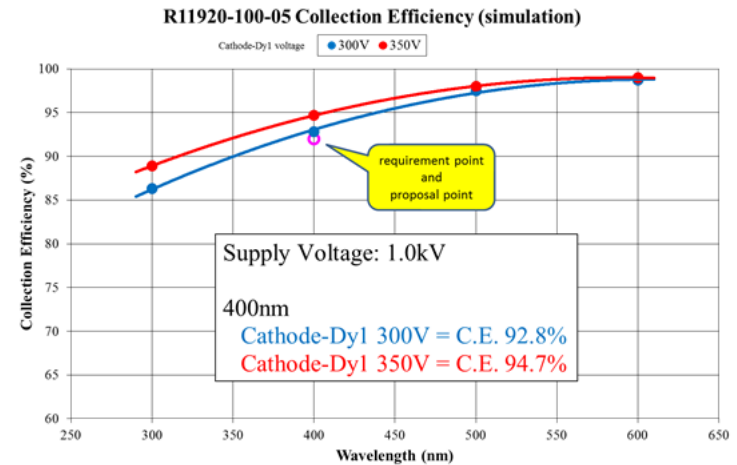
Light Guide



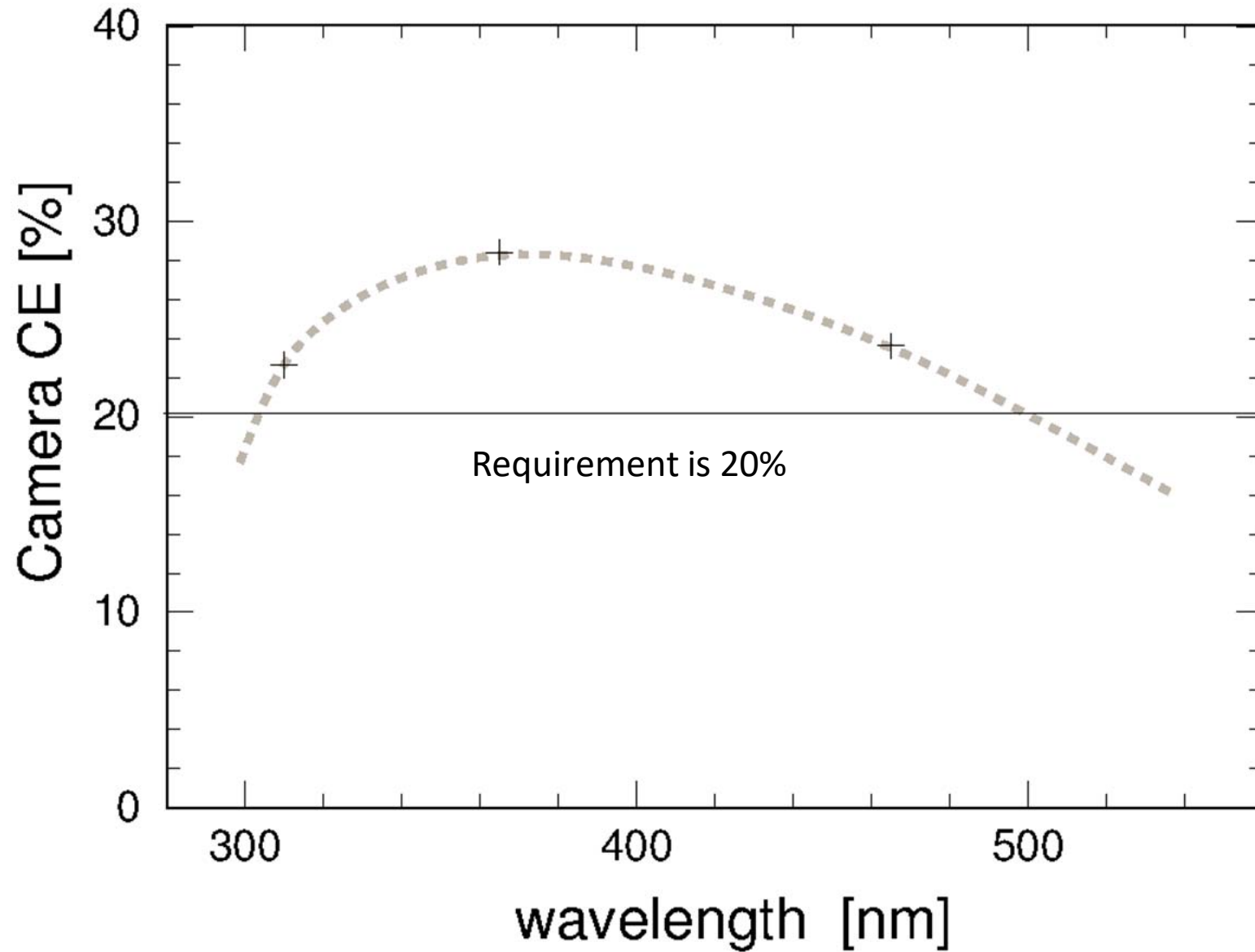
PMT QE



PMT CE

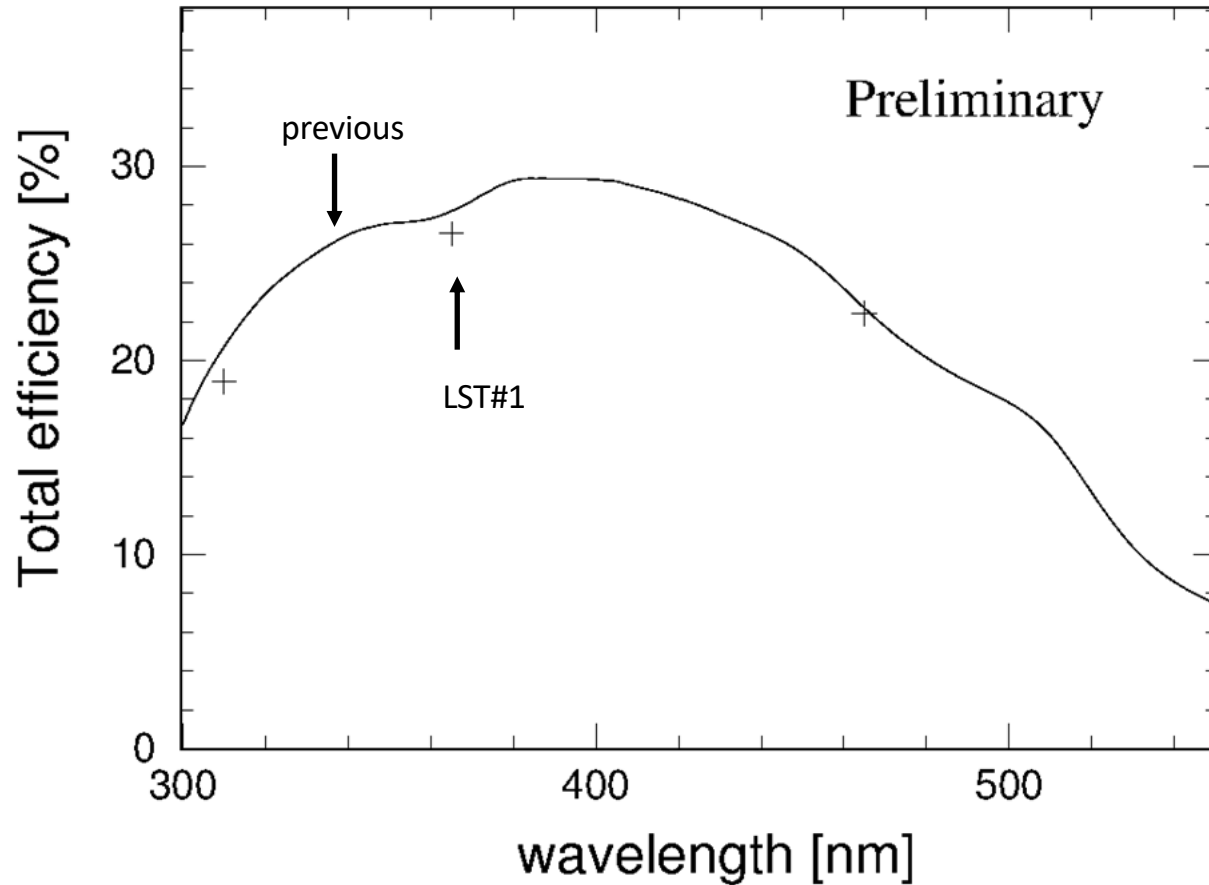


Light Collection Efficiency of the CAMERA of LST #1



Detection Efficiency is slightly modified

Total efficiency from mirror through PMT



Detection Efficiency is slightly modified

| Component | | Efficiency (ϵ_i) | Efficiency ($\epsilon_{\text{subtotal}}$) | Efficiency (ϵ_{total}) | |
|---|--|-----------------------------|---|--|-------|
| Optical Throughput | | | / | / | |
| ϵ_{mir} | Mirror reflectance | 0.904 | | | |
| Camera Photon Detection Efficiency | | | | | |
| ϵ_{ent} | Entrance window | 0.895 | | | |
| ϵ_{LC} | Light concentrator ($\theta_c=28.4$) | 0.887 | | | |
| ϵ_{QE} | QE of PMT | R11920 | | | 0.337 |
| | | R12992 | | | 0.344 |
| ϵ_{CE} | CE of PMT | 0.95 | | | |
| Nominal Telescope Photon Detection Efficiency (PMT R12992) | | | | 0.235 | |
| Faulty mirrors/AMC | | 0.98 | 0.845 (Mirror sample E14) | / | |
| Mirror degradation (10yr) at 370 nm | E14 | 0.878 | 0.750 (Mirror sample E15) | | |
| | E15 | 0.779 | | | |
| Entrance window degradation (10yr) | | 0.982 | | | |
| Minimum Telescope Photon Detection Efficiency during operation (10 yr) | | | | 0.198 (Mirror E14) 0.176 (Mirror E15) | |
| Requirement | | A-PERF-2020 | | >0.15 | |

preliminary
Rough estimation

→ ~0.225

→ ~0.169