

STRAY LIGHT

DESIGN, ANALYSIS & TESTING

Stray light is unwanted light reaching the image plane that can degrade image quality. The Space Dynamics Laboratory has designed numerous optical systems with stray light rejection in mind, having decades of experience in stray light design, analysis, and testing.

Benefits include:

- Design verification prior to the system build, as it is easier to correct the design than hardware.
- Stronger definition of the scatter requirements for optical surfaces & coatings.
- Reduced risk of having a stray light problem once the system is operational.

Because SDL has strong heritage in building telescopes, our engineers know what to test for and how to correct issues.

STRAY LIGHT ENGINEERING SERVICES

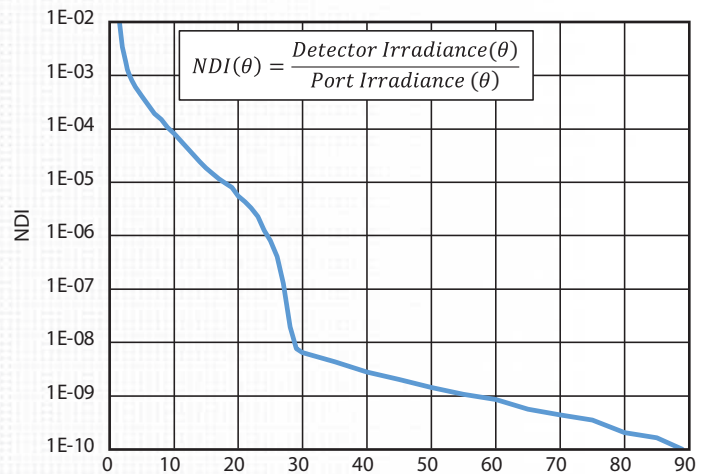
- Baffle design
- Non-sequential ray tracing
- Component & system level modeling & testing
- Exact modeling of mechanical objects
- Library of scatter characteristic of optical surfaces & coatings
 - Optical surface roughness
 - Particulate contamination
 - Black paints

TYPES OF ANALYSIS

- Estimation of stray light rejection performance (PST, NDI, etc.)
- Reverse ray tracing to identify critical surfaces & important external stray light source locations in angle space
- Thermal self-emission (TSE)

NORMALIZE DETECTOR IRRADIANCE (NDI)

The NDI, also called the Point Source Transmittance (PST), is the most common stray light performance figure of merit. It is a measure of the stray light suppression as a function off-axis source position.



REVERSE RAY TRACE

Rays originating from the system's focal plane are traced out of the system to show stray light areas of interest (hot spots - shown in red and orange) in the angular space of an off-axis source.

