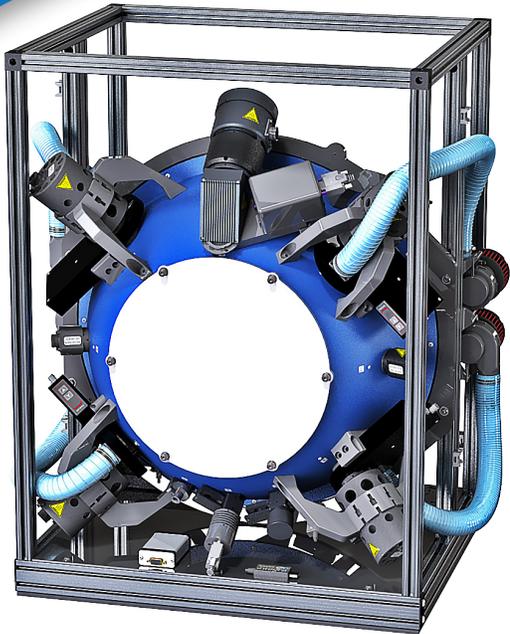
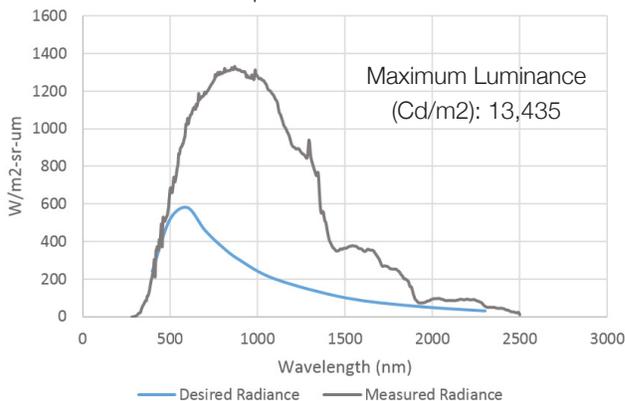


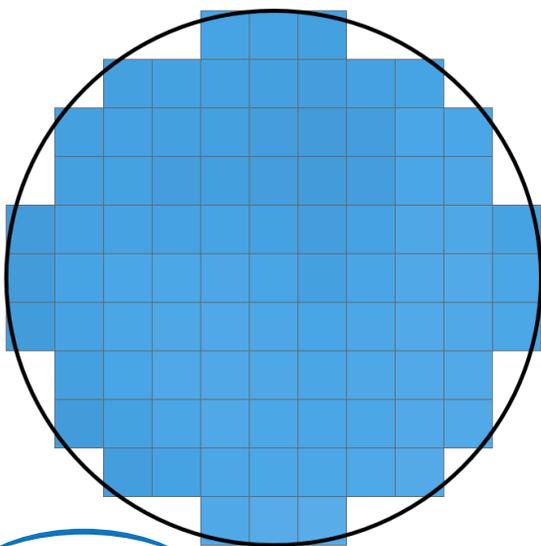
Adaptive HELIOS Uniform Source with Filter Wheels



Spectral Radiance



Spatial Uniformity



Technical Challenge

A client needed to perform important calibrations on a hyperspectral sensor it had been developing to be used in satellites and drones to detect anomalies a standard camera couldn't. In addition to standard white-light testing, they intended to perform other specific tests using NIST-calibrated absorption filters over the light sources. This client had used a similar uniform source system in the past, however; new developments required a wider aperture and subsequently, a larger sphere.

Labsphere's Solution

A standard Labsphere HELIOS system is capable of achieving the desired radiance using a selection of lamps and detectors. However, with the inclusion of NIST's filters, some unique features needed to be incorporated to keep the system reliable and easy to use.

- Four halogen lamps positioned symmetrically around the exit port
 - Filter wheels with six slots to fit an open aperture and up to five NIST filters - operated with simple button controls
 - Air cooling system to control the heat generated by the lamps
 - Air intake is filtered and blown directly to the filter wheel through flexible duct tubes
- Three additional lamps to achieve the requested spectral radiance
- Variable attenuator for continuous adjustability
- Adapter for client's spectrometer
- Silicon and InGaAs detectors for readings across the full active spectrum
 - Both equipped with light-tight filter and aperture sliders featuring pin-hole and dark shutter, as well as a photopic filter and slot for an additional filter

Benefits

- With the application-specific mounts built for the filter wheels, the client is able to apply and use their filters easily.
- The cooling system prevents any heat damage from occurring to the filters.
- Labsphere exceeded the client's spectral requirements, ensuring that they can perform any test they need.
- With 98.1% spacial and 96.2% angular uniformity, the system ensures accurate results on every test.
- Broad spectral control and availability, allowing easy adjustment of spectral radiance, color temperature, and wavelength distribution with Labsphere's HELIOSense software.
- Labsphere was able to design, build, test, and ship the system within a tight deadline of just over two months.