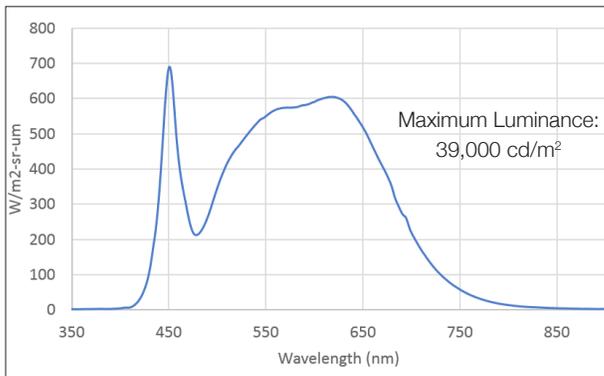


LED HalfMoon® Calibration System for Wide FOV Cameras



Port Hole Diameter	Uniformity
4 inches	98.6%
3 inches	99.2%
1 inch	99.8%

Spectral Radiance



Technical Challenge

A client was developing a camera with a hyperfocal lens and 130° field of view (FOV), and needed a uniform light source to flat-field the device. Flat-fielding a camera requires very high uniformity, and a wide FOV meant the area of uniformity would need to be much larger than that of a standard camera.

Labsphere's Solution

Labsphere's HalfMoon integrating hemisphere system might have worked well here, but it needed some application-specific modifications to fit the client's requirements. Careful consideration was made to ensure high uniformity over such a wide angle.

- Light integrated from four radially symmetric LEDs illuminate the device under testing (DUT) with a luminance range of 100 - 11,400fL
- Photopic silicon detector and SC-6000 photometer for accurate system calibration and luminance monitoring
- Constant-current power supply programmable via MATLAB distributes power equally across each LED
- Luminance port diameter reducers for testing of several different size cameras
- Port cover to protect the sphere interior from dust or debris

The design of the luminance port and reducers allowed the client to easily mount their cameras to the frame and begin testing. The geometry of the integrating hemisphere gave the camera a full, even view of the luminance of the Spectralon liner while using mirrors to create a virtual integrating sphere in the interior. This resulted in exceptionally high uniformity over the entire FOV.

Benefits

- The application-specific port adapters give the user the flexibility to test multiple cameras with one system
- The HalfMoon source is capable of reaching a wide range of luminance, allowing the user to test over specific level settings over the dynamic range on the systems
- Per the client's request, the power supply is easily programmable, and can be controlled through MATLAB, allowing the client to customize and automate the testing process
- Labsphere's SC-6000 radiometer enables accurate spectral monitoring and feedback control
- With the extremely high uniformity values, the client can attain accurate and reliable data, and flat-field wide angle FOV cameras with confidence

