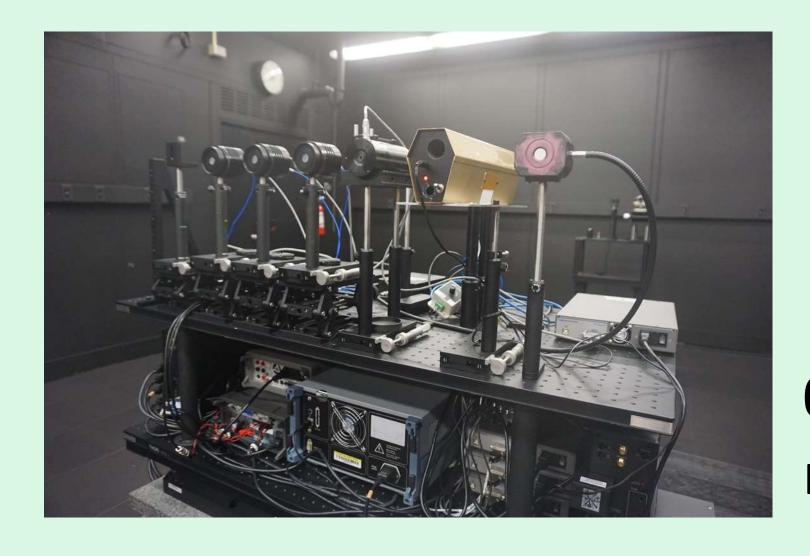


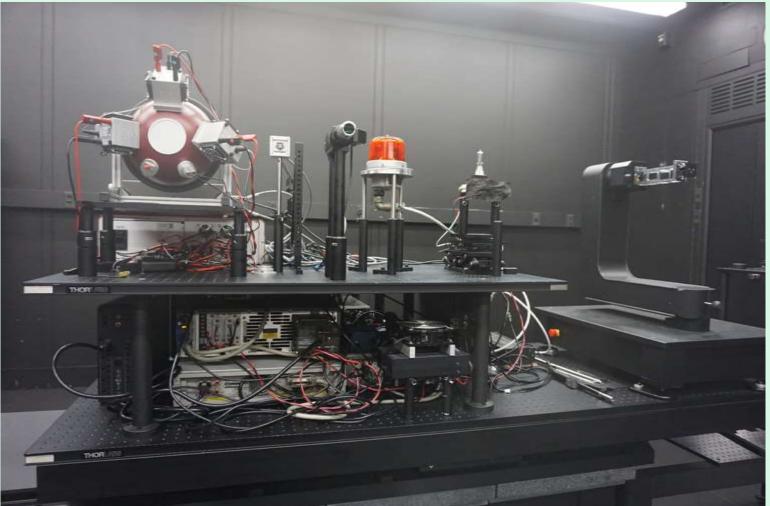
Improvements in optical metrology for solid-state lighting

New Photometric Bench



6 m ball screw, 5 m travel, $\Delta d = 50 \times 10^{-6}$ m





1.5 m long travel sources stage for FEL lamp, LED, flashing light, integrating sphere, tunable laser,

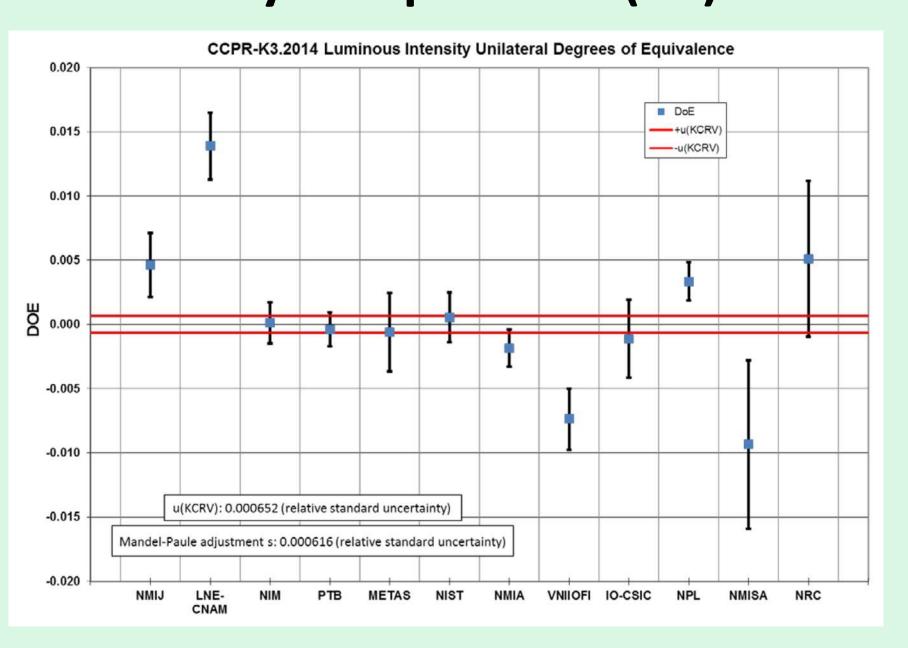
goniophotometer

Dissemination of SI unit candela (since 1901)

Sources: candela − 0.25 % (*k*=2)

0.8 m long travel sensors stage for photometer, colorimeter, radiometer, spectroradiometers, cameras, hyperspectral imagers

Key comparisons (K3)

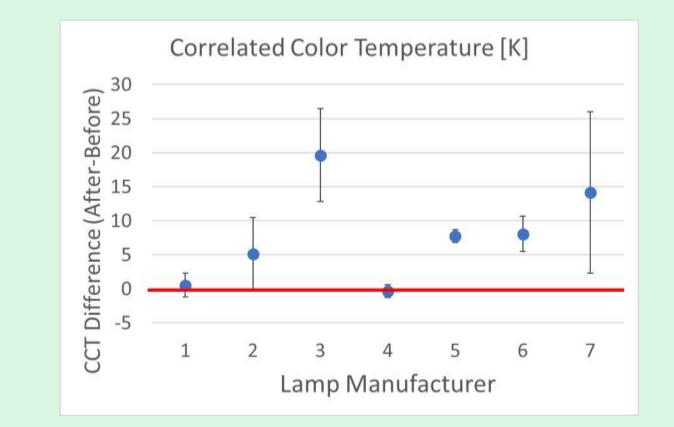


Yuqin Zong, Benjamin Tsai, & Cameron Miller National Institute of Standards & Technology



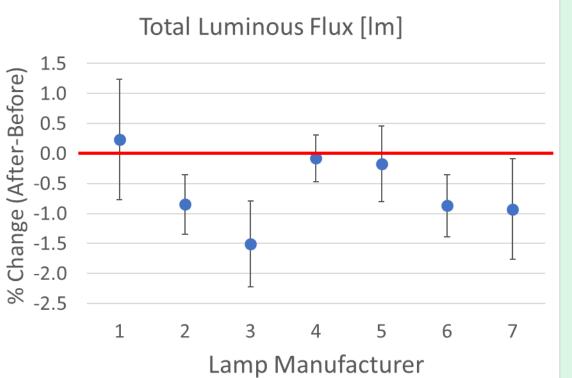
Luminaire & Lamp Tests

- 1. Storage test
- High temp/High humidity
- 2. Operational test
- Power cycling (30 s on/30 s off)
- High temp & power cycling
- 3. Electromagnetic test
 - Electrical transient susceptibility
- 4. Mechanical test
 - Vibration



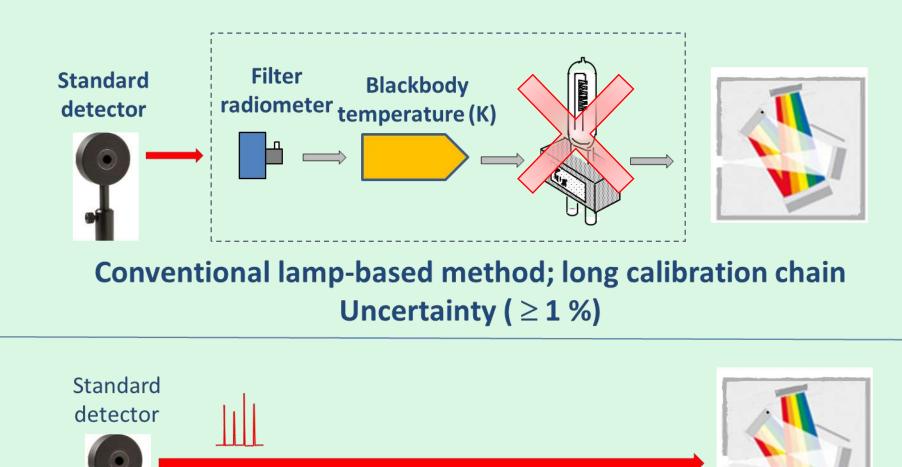
Robustness Testing

Storage test results Total Luminous Flux [lm]



70 °C 75.0 % 200 h

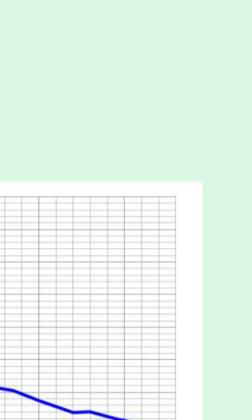
New Scale Realization

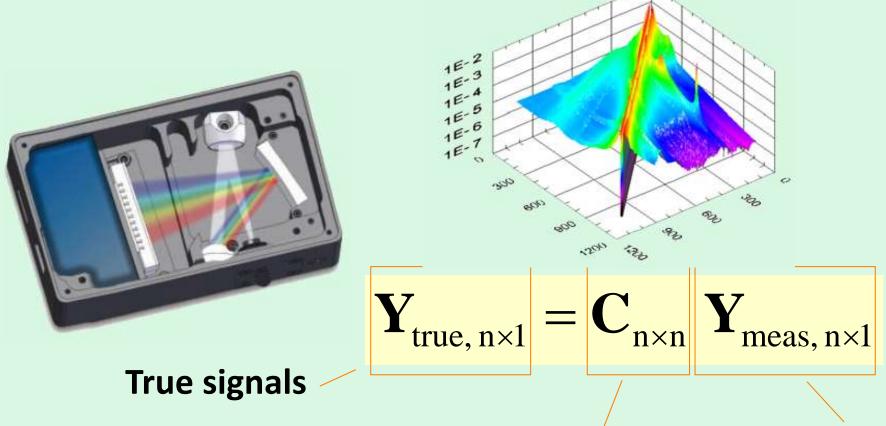


New detector-based method (0.2 %); enables a new independent way to realize spectral irradiance/radiance scales on spectroradiometers



Compact tunable laser facility for Candela realization, calibrations, and research







Raw signals

LED validation < 0.05

% over a year

Simple stray light correction method for array spectroradiometers and imaging systems

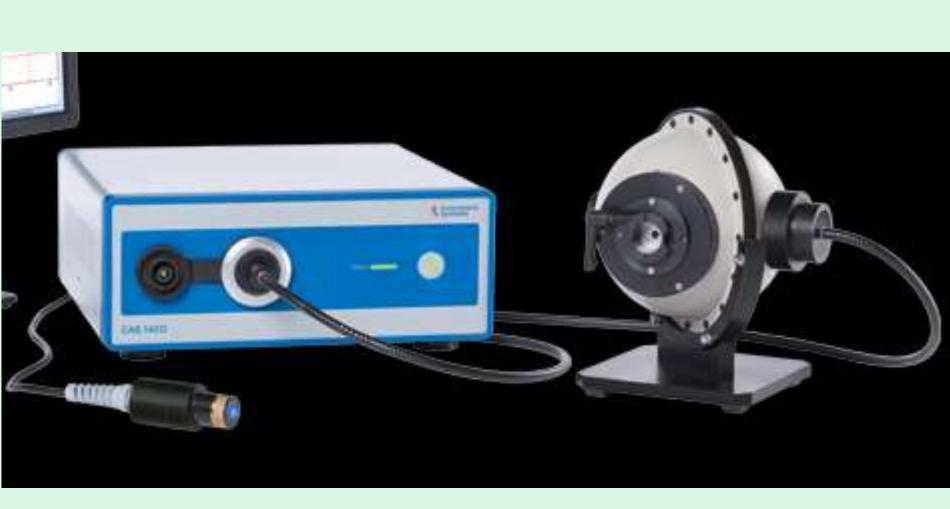
Line Spread Function (LSF) and Slit Scattering Function (SSF) Mirror SSF $\Delta \lambda_{p-p}$ pixel-to-pixel interval $\Delta \lambda_{dead}$ dead region 0.9 0.9 0.8 0.7 0.9 0.9 0.8 0.7 0.0 0.9 0.8 0.7 0.9 0.9 0.8 0.0 0.0 0.0 0.1 0.0 0.0 0.1 0.0 0.0 0.1 0.0 0.1 0.0 0.0

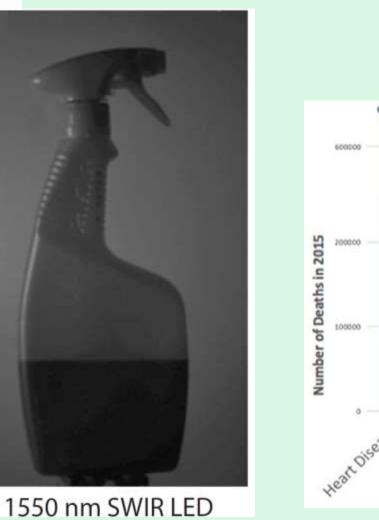
LGS350-110 benchtop version

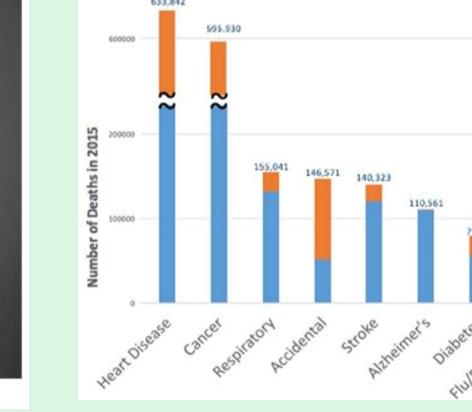
Visible White

www.smartvisionlights.com

UV & IR LEDs







One in every 25 Hospital Admissions are infected with an HAI

