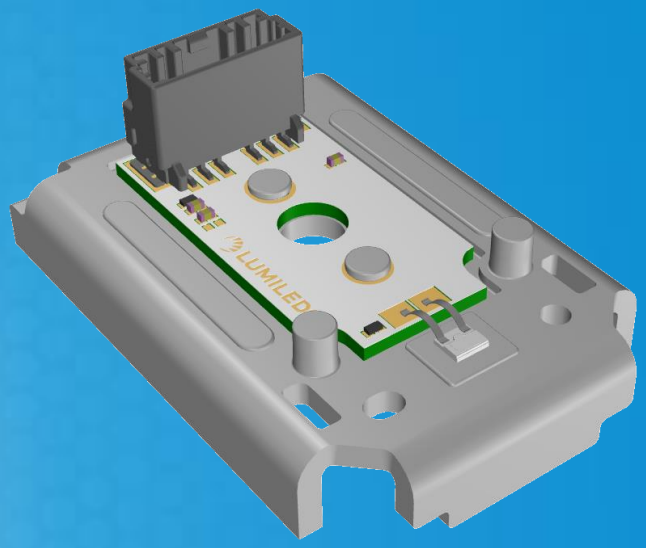
LUXEON Go 1x2

Optical Rayset Readme

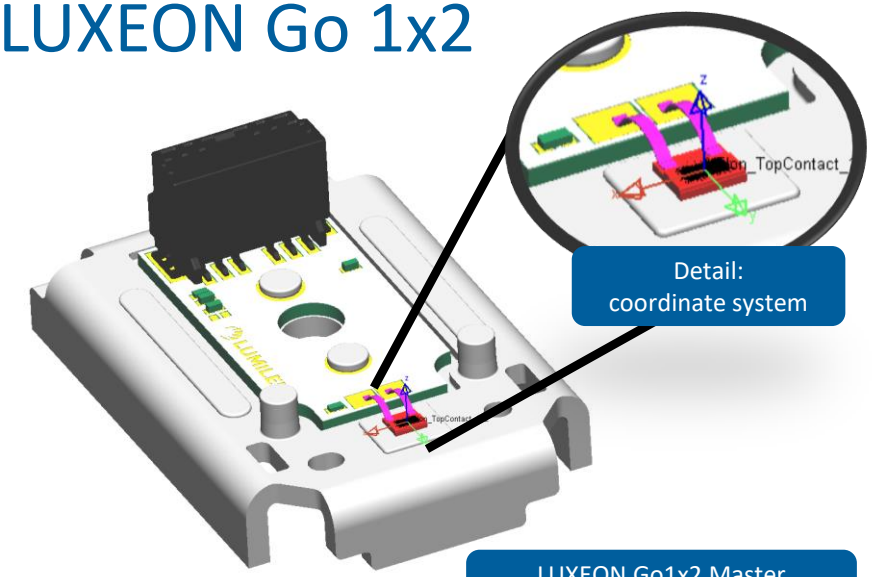
March,26th, 2020

Download links updated on Nov,6th,2020



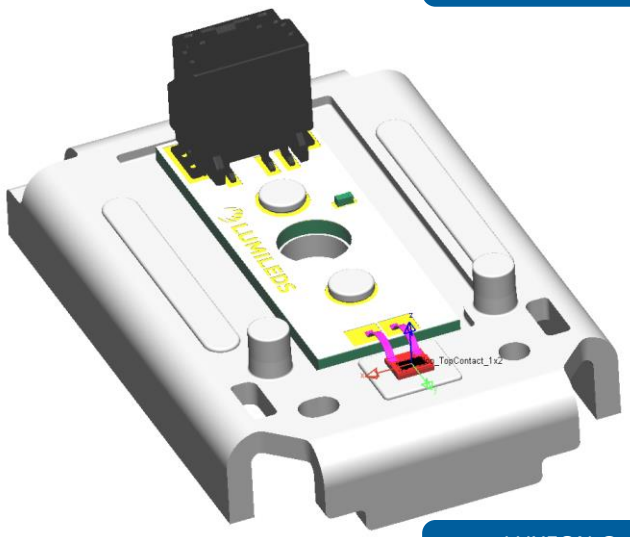
LUMILEDS

LUXEON Go 1x2



Detail:
coordinate system

LUXEON Go1x2 Master
Simulation model in LightTools



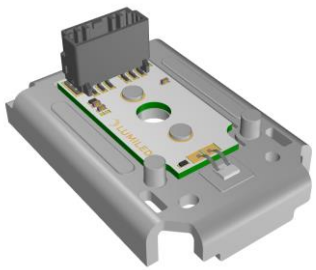
LUXEON Go1x2 Slave
Simulation model in LightTools

Coordinate System

- Rayfiles and CAD are defined in the same coordinate system
  - x-axis: red, y-axis: green, z-axis: blue
- xy center: center of light emitting area
- z=0 plane: top edge of light emitting area

- To use raydata and geometry together, you can follow these steps:
  - Import the CAD
  - Load the rayfile
  - The lamp geometry and rays are now oriented in the coordinate system as described above.
  - To re-align both, you can group both items and shift it to the desired coordinates and change the orientation of the group to match the desired orientation
- Alternative way:
  - Define a local coordinate system with correct origin and orientation
  - Import CAD and rayfile into this local coordinate system
- For optical design with the lamp we recommend to build a ray tracing model of the lamp from this CAD. Recommended model properties are described on the page: ‚Model for Ray-Tracing' in this documentation

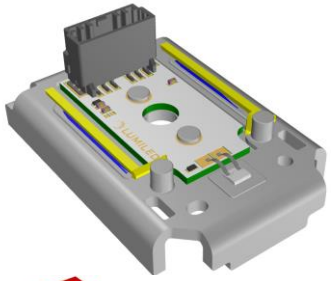
LUXEON Go 1x2 – CAD Files Provided

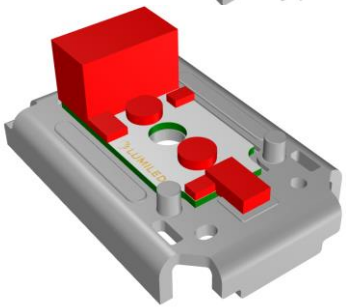


Shown as example:
LUXEON Go1x2 Master

CAD for Optical Design-In

- Step files with all parts of lamp relevant for optical simulation
- Only lamp parts inside model
- Volumes are reduced to minimum number to facilitate building of optical model
  - 9298 003 030 00-LUXEON Go-1x2 chip master--optical --B0--REV03.stp
  - 9298 003 031 00-LUXEON Go-1x2 chip slave--optical --B0--REV03.stp

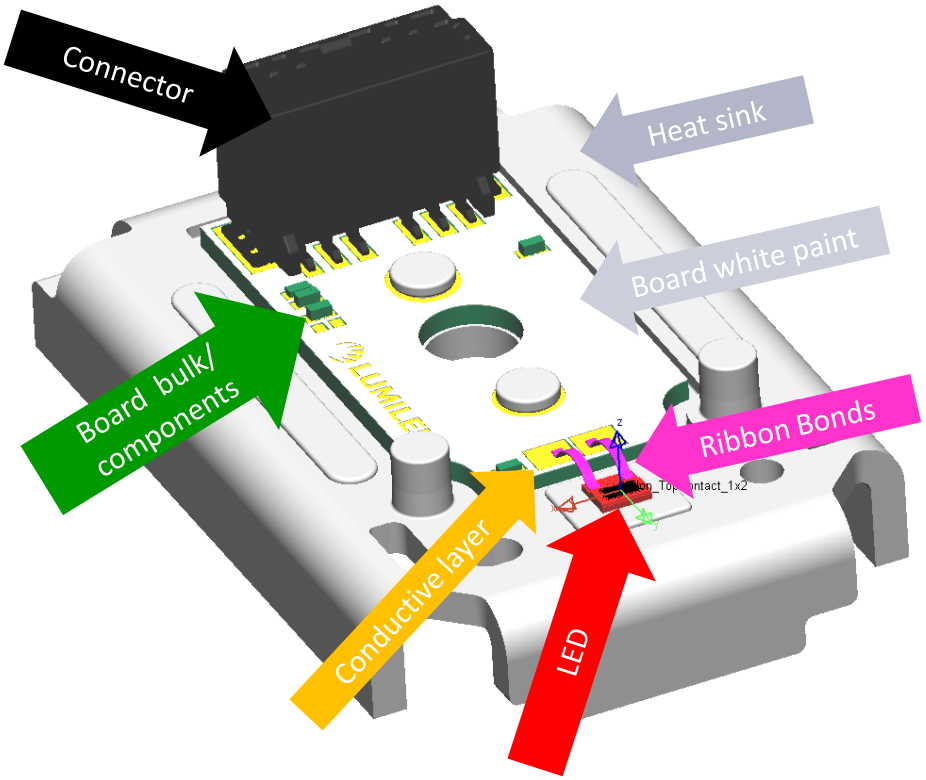




CAD for Mechanical Design-In

- CAD file for supporting mechanical design containing:
  - lamp geometry
  - exemplary reference features for fitting (yellow)
  - precision surfaces on z-reference (not shown, refer to Application Brief/Data Sheet for detail)
  - ‘stay out volumes’ (red) . Any mechanical design of the luminaire should stay of these volumes to provide proper mounting and operation of the lamp.
    - 9298 003 030 00-LUXEON Go-1x2 chip master --B0--REV03.igs
    - 9298 003 030 00-LUXEON Go-1x2 chip master --B0--REV03.stp
    - 9298 003 031 00-LUXEON Go-1x2 chip slave --B0--REV03.igs
    - 9298 003 031 00-LUXEON Go-1x2 chip slave --B0--REV03.stp

LUXEON Go 1x2



simulation model of lamp with recommended optical surface properties shown in false colors
LUXEON Go 1x2 Master as example

Model for Ray-Tracing

- We recommend to include the lamp geometry into ray-tracing when designing with LUXEON Go. This provides consideration of any stray light paths in the system interfering with the lamp.
- The table indicates practical optical properties for simulation of the lamp components.
- The parameters of the models are based on estimated values, typical for the used materials.

Element	Property
LED	95% diffuse reflectance
Ribbon bonds	80% specular reflectance with Gaussian distribution, sigma 3°
Board white paint	85% reflectance. Hereof: 30% diffuse, 70% specular Gaussian 5° sigma
Board conductive layer	75% diffuse reflectance
Board bulk and components	80% diffuse reflectance
Connector	absorbing
Heat sink	85% reflectance. Hereof: 70% diffuse, 30% specular Gaussian 5° sigma

LUXEON Go 1x2 (Photometric Data)

photometric data taken from LUXEON Altilon TopContact 1x2

Link to download folder

https://raysets.lumileds.com/index.php/s/ZfNRMMBZoWGHGMj

Files available for download

Prosource

RS8	LUXEON_Altilon_TopContact_1x2_20200206_1248.rs8	276 MB	

LightTools

Spectral Projected	LUXEON_Altilon_TopContact_1x2_20200206_40MRays_proj_spectral_LT.ray	1.19 GB	40MRays
Y-Component Projected	LUXEON_Altilon_TopContact_1x2_20200206_20MRays_proj_Y_LT.ray	534 MB	20MRays
Z-Component Projected	LUXEON_Altilon_TopContact_1x2_20200206_20MRays_proj_Z_LT.ray	533 MB	20MRays

ASAP & LucidShape

Y-Component Projected	LUXEON_Altilon_TopContact_1x2_20200206_20MRays_proj_Y_ASAP.dis	534 MB	20MRays
Z-Component Projected	LUXEON_Altilon_TopContact_1x2_20200206_20MRays_proj_Z_ASAP.dis	533 MB	20MRays

OPTIS SPEOS

Y-Component Spectral Projected	LUXEON_Altilon_TopContact_1x2_20200206_20MRays_proj_Y_spectral_Speos.ray	610 MB	20MRays
Z-Component Spectral Projected	LUXEON_Altilon_TopContact_1x2_20200206_20MRays_proj_Z_spectral_Speos.ray	609 MB	20MRays

Zemax

Spectral Projected	LUXEON_Altilon_TopContact_1x2_20200206_40MRays_proj_spectral_zemax.dat	1.19 GB	40MRays

Far Field

IES	LUXEON_Altilon_TopContact_1x2_20200206_40MRays.ies	10.6 kB	

Spectrum

Spectrum	LUXEON_Altilon_TopContact_1x2_20200206_spectrum.txt	10.2 kB	

LUXEON Go 1x2 (CAD Lamp)

Link to download folder

https://raysets.lumileds.com/index.php/s/Md48XCe2jboMWaS

Files available for download

STEP lamp for raytracing

STEP	9298 003 030 00-LUXEON Go-1x2 chip master--optical --B0--REV03.stp	3 MB
STEP	9298 003 031 00-LUXEON Go-1x2 chip slave--optical --B0--REV03.stp	2 MB

CAD lamp for construction

STEP	9298 003 030 00-LUXEON Go-1x2 chip master --B0--REV03.stp	5 MB
IGS	9298 003 030 00-LUXEON Go-1x2 chip master --B0--REV03.igs	15 MB
STEP	9298 003 031 00-LUXEON Go-1x2 chip slave --B0--REV03.stp	3 MB
IGS	9298 003 031 00-LUXEON Go-1x2 chip slave --B0--REV03.igs	11 MB

Additional Application Notes

Randomization

In some cases, reducing the number of rays in a rayset might be desirable. In order to facilitate the generation of reduced raysets, **all raysets mentioned in this readme file are randomized**. Hence, a rayset having 5 million rays (5M) can simply be generated by taking the first 5M rays from 20M rayset.

Projected Raysets: Propagated ray starting points

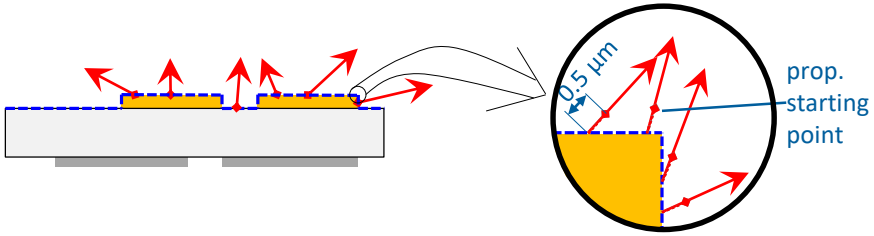
For projected raysets, the following procedure is applied for obtaining the starting points:

(1) Project rays on CAD surface (----) → ray starting points

(2) Propagate rays by 0.5 µm → propagated starting points (•)

All raysets mentioned in this readme file provide propagated starting points.

If raytracing includes the LED CAD, unpropagated rays are prone to be blocked at the surface. Rays with propagated starting points should not suffer from this problem.



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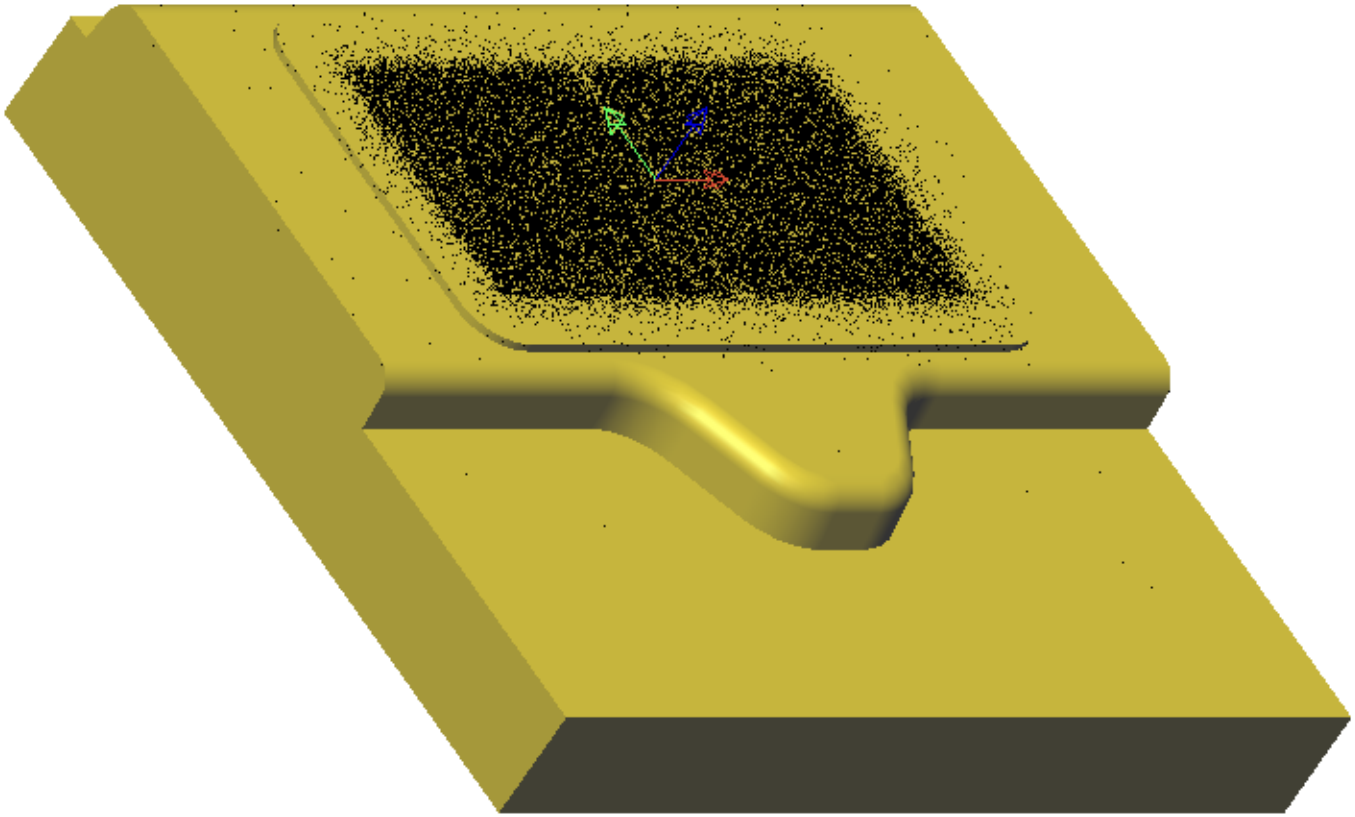
Luxeon Go 1x2

Documentation of photometric data taken from measurement of LUXEON Altilon TopContact 1x2

LUXEON Go 1x2

photometric data taken from LUXEON Altilon TopContact 1x2

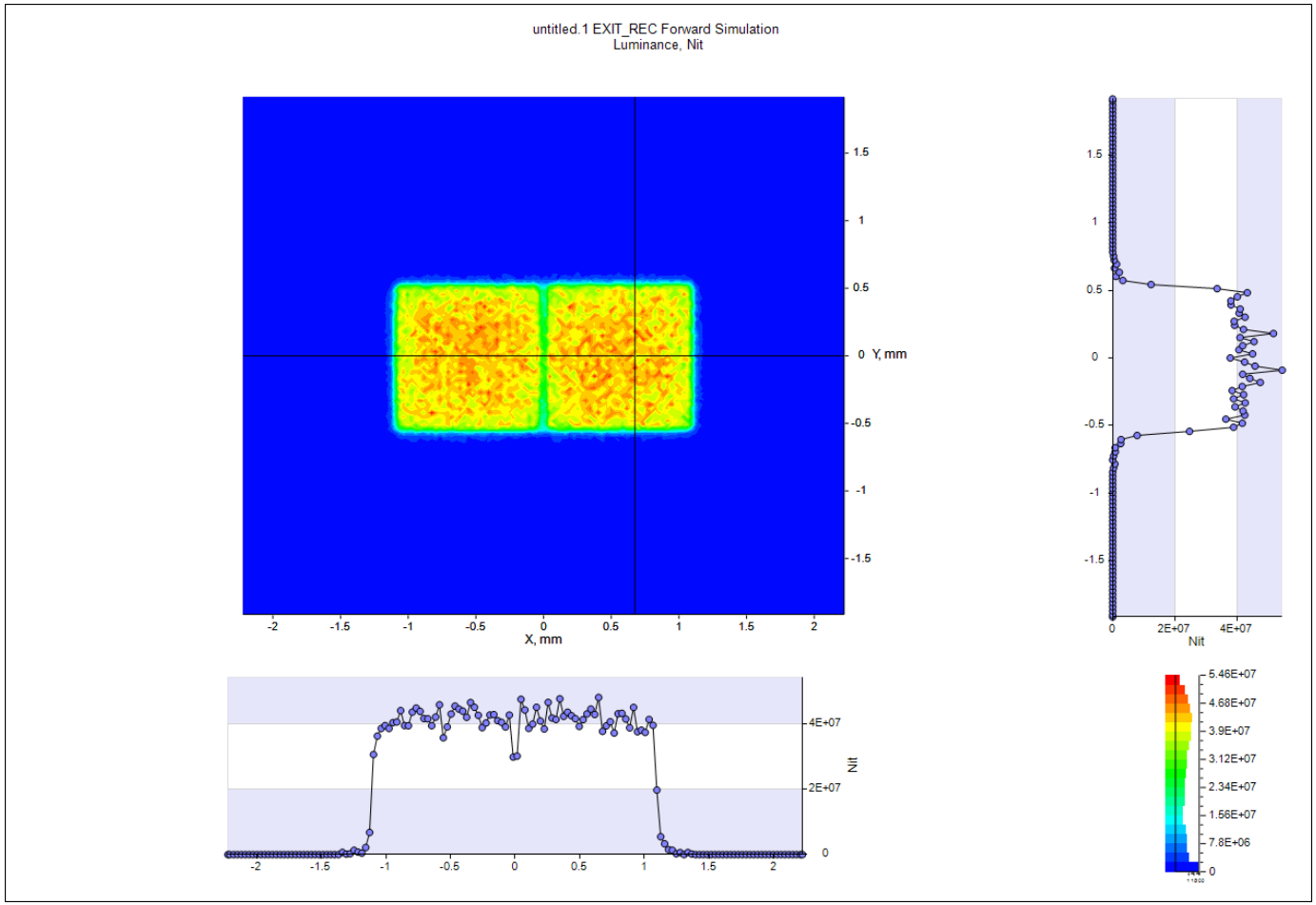
3D CAD view + ray starting points



LUXEON Go 1x2

photometric data taken from LUXEON Altilon TopContact 1x2

Source Size



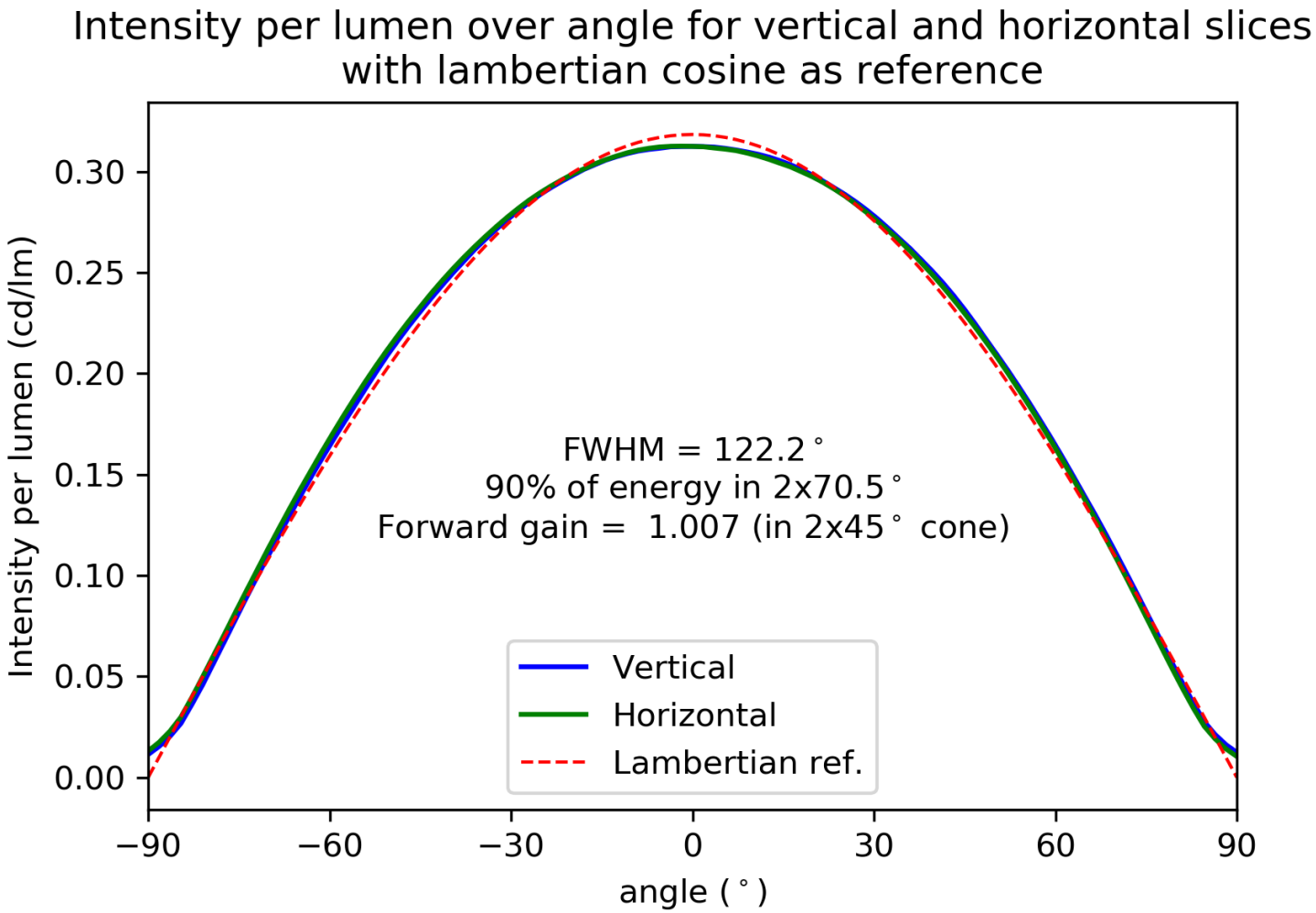
Source luminance (FWHM) = 2.22 x 1.06 mm²

The two orthogonal lines in the luminance image mark the reference planes of the two luminance cross sections.

LUXEON Go 1x2

photometric data taken from LUXEON Altilon TopContact 1x2

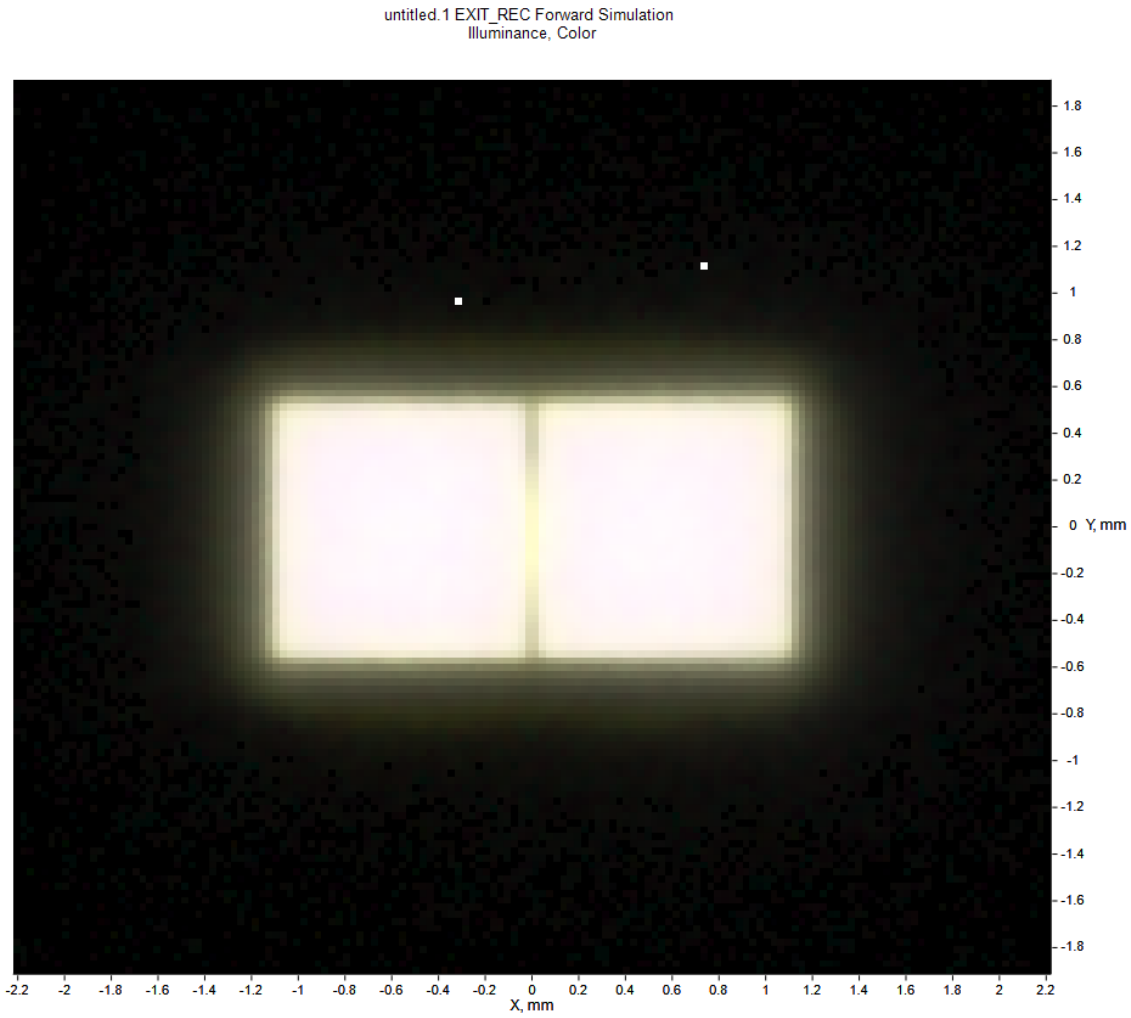
Luminous Intensity Distribution



LUXEON Go 1x2

photometric data taken from LUXEON Altilon TopContact 1x2

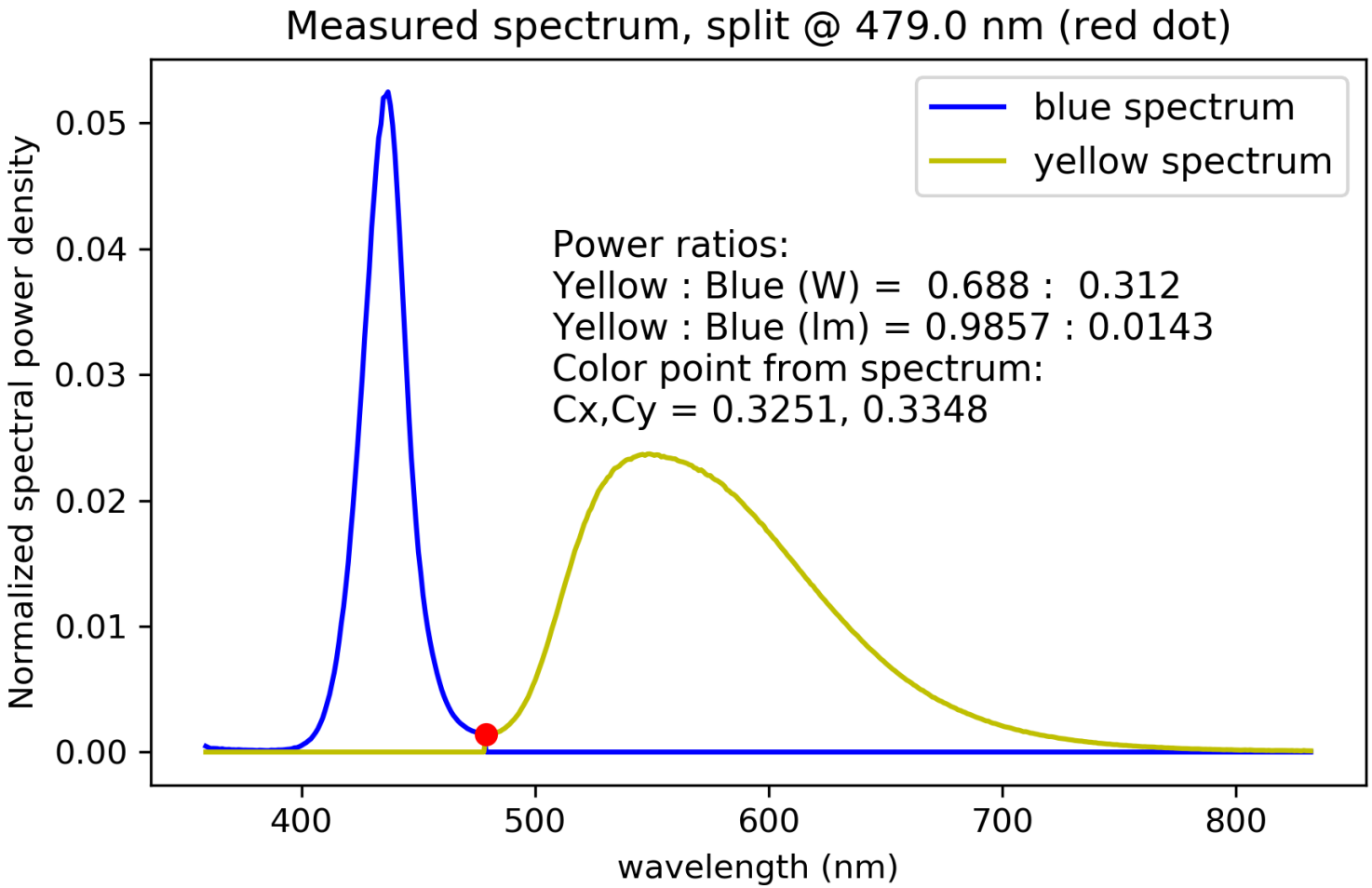
Illuminance color chart (color over position)



LUXEON Go 1x2

photometric data taken from LUXEON Altilon TopContact 1x2

Measured spectrum split in blue (Z) and yellow (Y) components



LUXEON Go 1x2

photometric data taken from LUXEON Altilon TopContact 1x2

Color data info

Parameter	Value
yellow : blue ratio (W) (from measured spectrum)	0.688 : 0.312
yellow : blue ratio (lm) (from measured spectrum)	0.9857 : 0.0143
Average color point Cx, Cy (from measured spectrum)	0.3251, 0.3348
Average color point Cx, Cy (from simulation)	0.3248, 0.3362
Color point Cx, Cy @ HV (from simulation)	0.3222, 0.3304
Average CCT (K) (from simulation)	5.854e+03

Download File Nomenclature (see next slide)

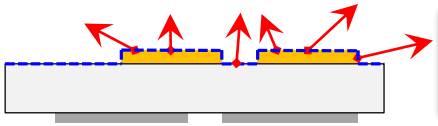
Example

LUXEON_Altilon_SMD2_1x4_gen4plus_20190206_20Mray_proj_Z_spectral_LT.ray

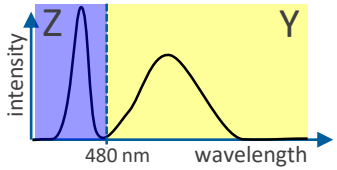
Product Name

Reference Date
helps identifying underlying dataset

Number of rays
e.g. 20 M = 20 · 10^6 rays



Ray starting points
'proj' indicates that ray starting points have been **projected** onto the CAD surface (---).



Spectral range

$$\begin{Bmatrix} \text{Y} \\ \text{Z} \\ - \end{Bmatrix} = \begin{Bmatrix} \text{only yellow} \\ \text{only blue} \\ \text{full} \end{Bmatrix} \text{ spectrum taken into account}$$

Spectral Information

$$\begin{Bmatrix} \text{spectral} \\ - \end{Bmatrix} = \text{individual rays} \begin{Bmatrix} \text{do} \\ \text{don't} \end{Bmatrix} \text{ carry wavelength information}$$

Target Software Package
LightTools (LT), ASAP, Zemax, …

File Extension

Lumileds measurement reference.: C24_LUXEON Altilon TopContact 1x2_20200206

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