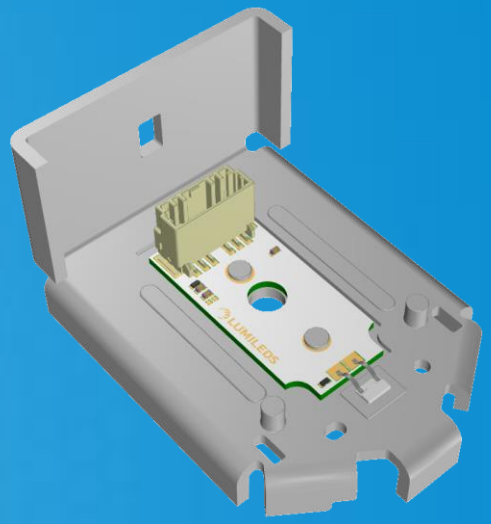
LUXEON Go 1x4

Optical Rayset Readme

May, 8th, 2020

Download links updated on Nov,6th,2020



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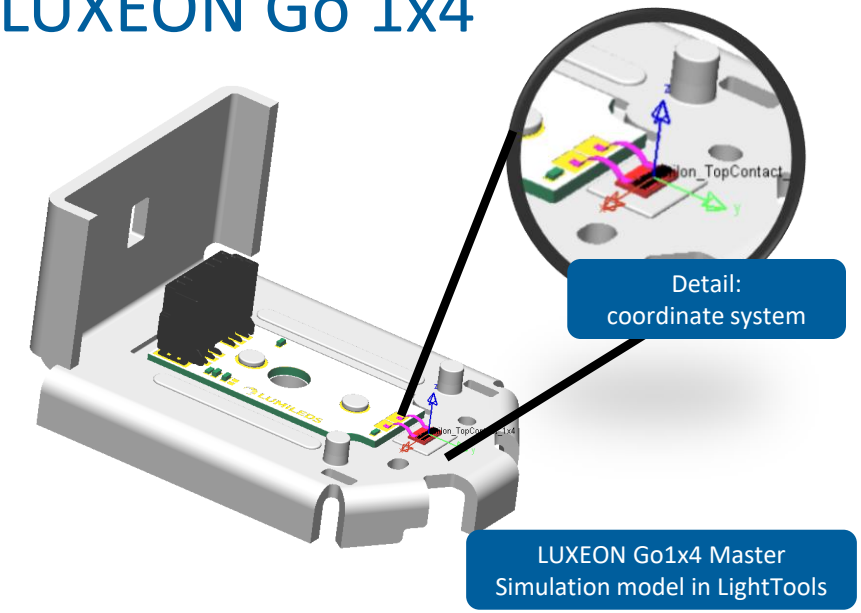
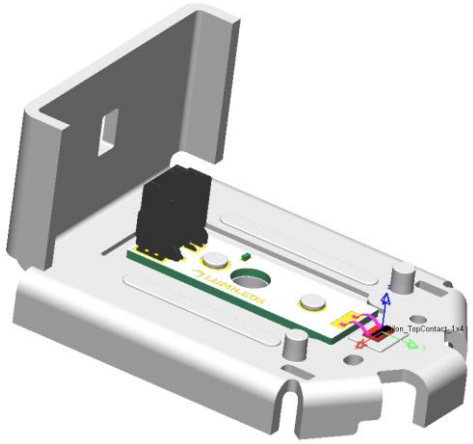
LUXEON Go 1x4



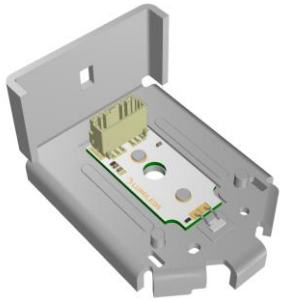


Coordinate System

- 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

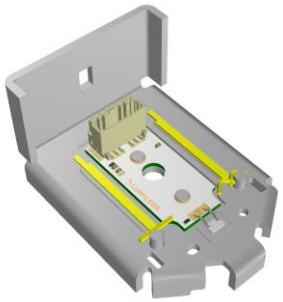
LUXEON Go 1x4 – CAD Files Provided

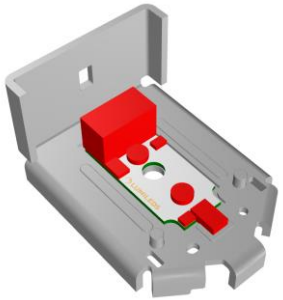


CAD for Optical Design-In

- 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 003 034 00-LUXEON Go-1x4 chip master--optical --B0--REV03.stp
  - 9298 003 035 00-LUXEON Go-1x4 chip slave--optical --B0--REV03.stp

Shown as example:
LUXEON Go1x4 Master

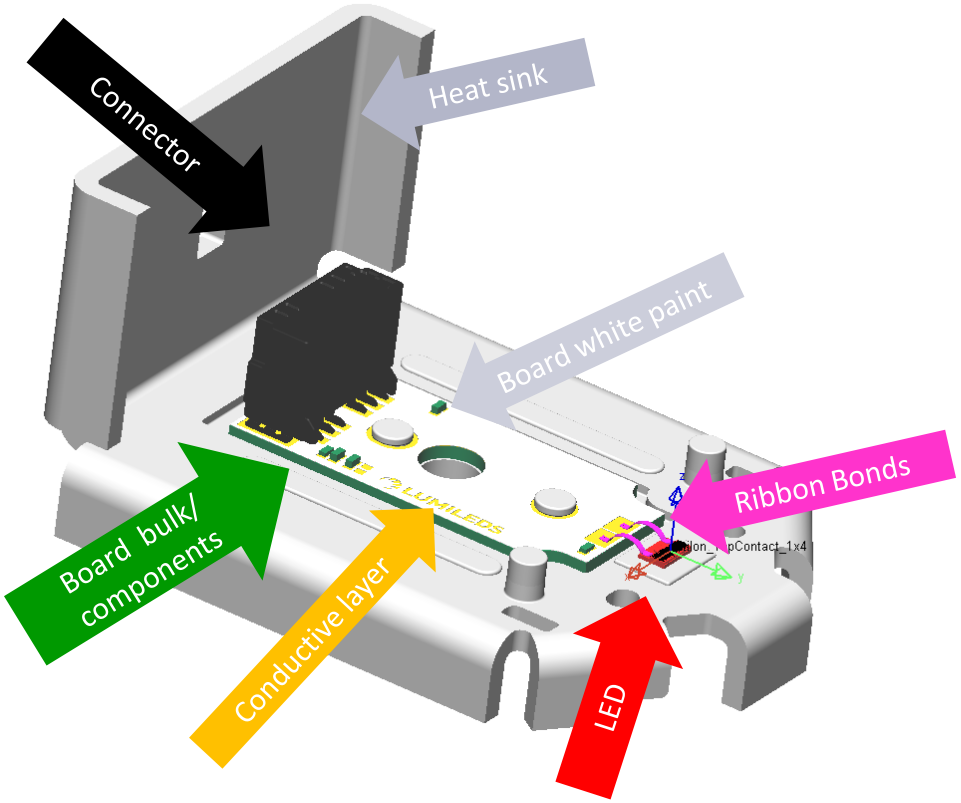




CAD for Mechanical Design-In

- 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 003 034 00-LUXEON Go-1x4 chip master --B0--REV03.stp
    - 9298 003 034 00-LUXEON Go-1x4 chip master --B0--REV03.igs
    - 9298 003 035 00-LUXEON Go-1x4 chip slave --B0--REV03.stp
    - 9298 003 035 00-LUXEON Go-1x4 chip slave --B0--REV03.igs

LUXEON Go 1x4



simulation model of lamp with recommended optical surface properties shown in false colors
LUXEON Go 1x3 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 1x4 (Photometric Data)

photometric data taken from LUXEON Altilon TopContact 1x4

Link to download folder

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

Files available for download

Prosource

RS8	LUXEON_Altilon_TopContact_1x4_20200310_1270.rs8	182 MB	

LightTools

Spectral Projected	LUXEON_Altilon_TopContact_1x4_20200310_40MRays_proj_spectral_LT.ray	1.18 GB	40MRays
Y-Component Projected	LUXEON_Altilon_TopContact_1x4_20200310_20MRays_proj_Y_LT.ray	531 MB	20MRays
Z-Component Projected	LUXEON_Altilon_TopContact_1x4_20200310_20MRays_proj_Z_LT.ray	530 MB	20MRays

ASAP & LucidShape

Y-Component Projected	LUXEON_Altilon_TopContact_1x4_20200310_20MRays_proj_Y_ASAP.dis	531 MB	20MRays
Z-Component Projected	LUXEON_Altilon_TopContact_1x4_20200310_20MRays_proj_Z_ASAP.dis	530 MB	20MRays

OPTIS SPEOS

Y-Component Spectral Projected	LUXEON_Altilon_TopContact_1x4_20200310_20MRays_proj_Y_spectral_Speos.ray	606 MB	20MRays
Z-Component Spectral Projected	LUXEON_Altilon_TopContact_1x4_20200310_20MRays_proj_Z_spectral_Speos.ray	606 MB	20MRays

Zemax

Spectral Projected	LUXEON_Altilon_TopContact_1x4_20200310_40MRays_proj_spectral_zemax.dat	1.18 GB	40MRays

Far Field

IES	LUXEON_Altilon_TopContact_1x4_20200310_40MRays.ies	10.6 kB

Spectrum

Spectrum	LUXEON_Altilon_TopContact_1x4_20200310_spectrum.txt	10.2 kB

CAD

STEP	LUXEON_Altilon_TopContact_1x4_20200310_geometry.STEP	367 kB
IGES	LUXEON_Altilon_TopContact_1x4_20200310_geometry.IGS	363 kB

LUXEON Go 1x4 (CAD Lamp)

Link to download folder

https://raysets.lumileds.com/index.php/s/aq3JmqCycCcEKCw

Files available for download

STEP lamp for raytracing

STEP	9298 003 034 00-LUXEON Go-1x4 chip master--optical --B0--REV03.stp	3 MB
STEP	9298 003 035 00-LUXEON Go-1x4 chip slave--optical --B0--REV03.stp	2 MB

CAD lamp for construction

STEP	9298 003 034 00-LUXEON Go-1x4 chip master --B0--REV03.stp	4 MB
IGS	9298 003 034 00-LUXEON Go-1x4 chip master --B0--REV03.igs	15 MB
STEP	9298 003 035 00-LUXEON Go-1x4 chip slave --B0--REV03.stp	3 MB
IGS	9298 003 035 00-LUXEON Go-1x4 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

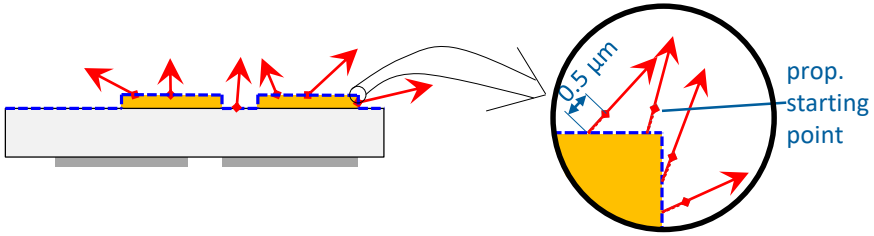
For projected raysets, the following procedure is applied for obtaining the starting points:

(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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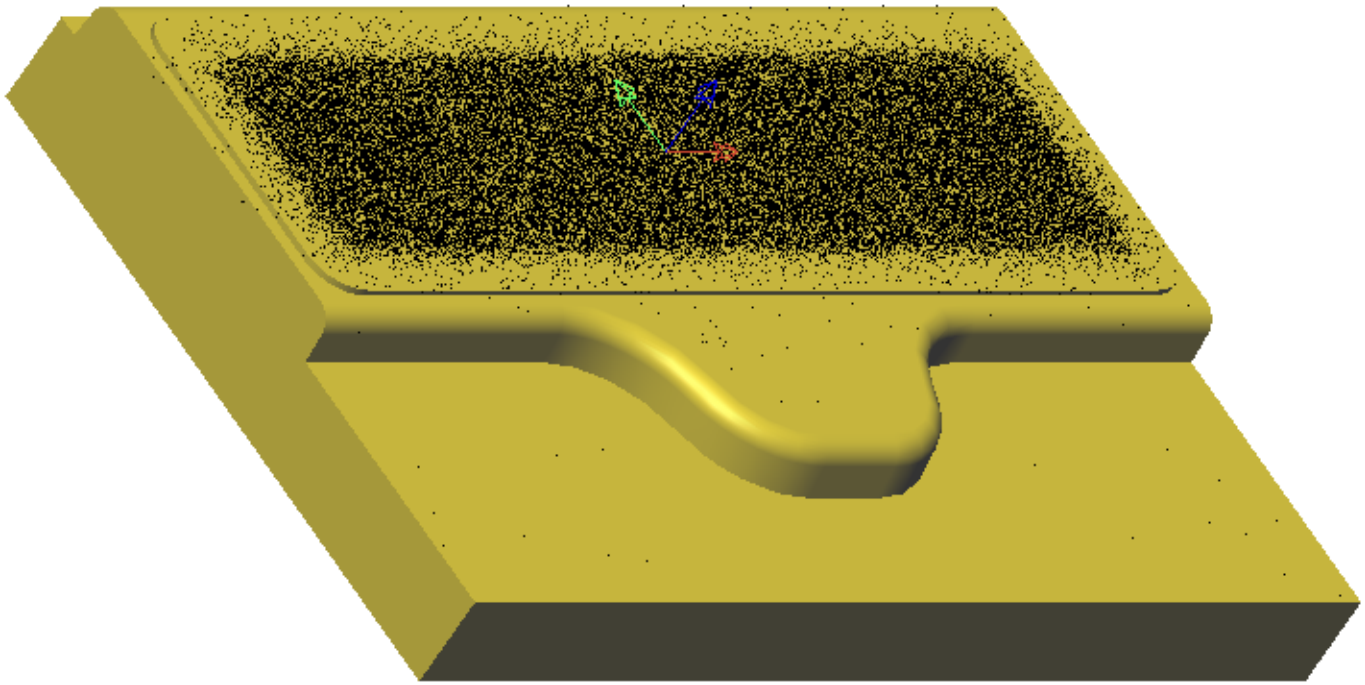
Luxeon Go 1x4

Documentation of photometric data taken from measurement of LUXEON Altilon TopContact 1x4 Gen6

LUXEON Go 1x4

photometric data taken from LUXEON Altilon TopContact 1x4 Gen6

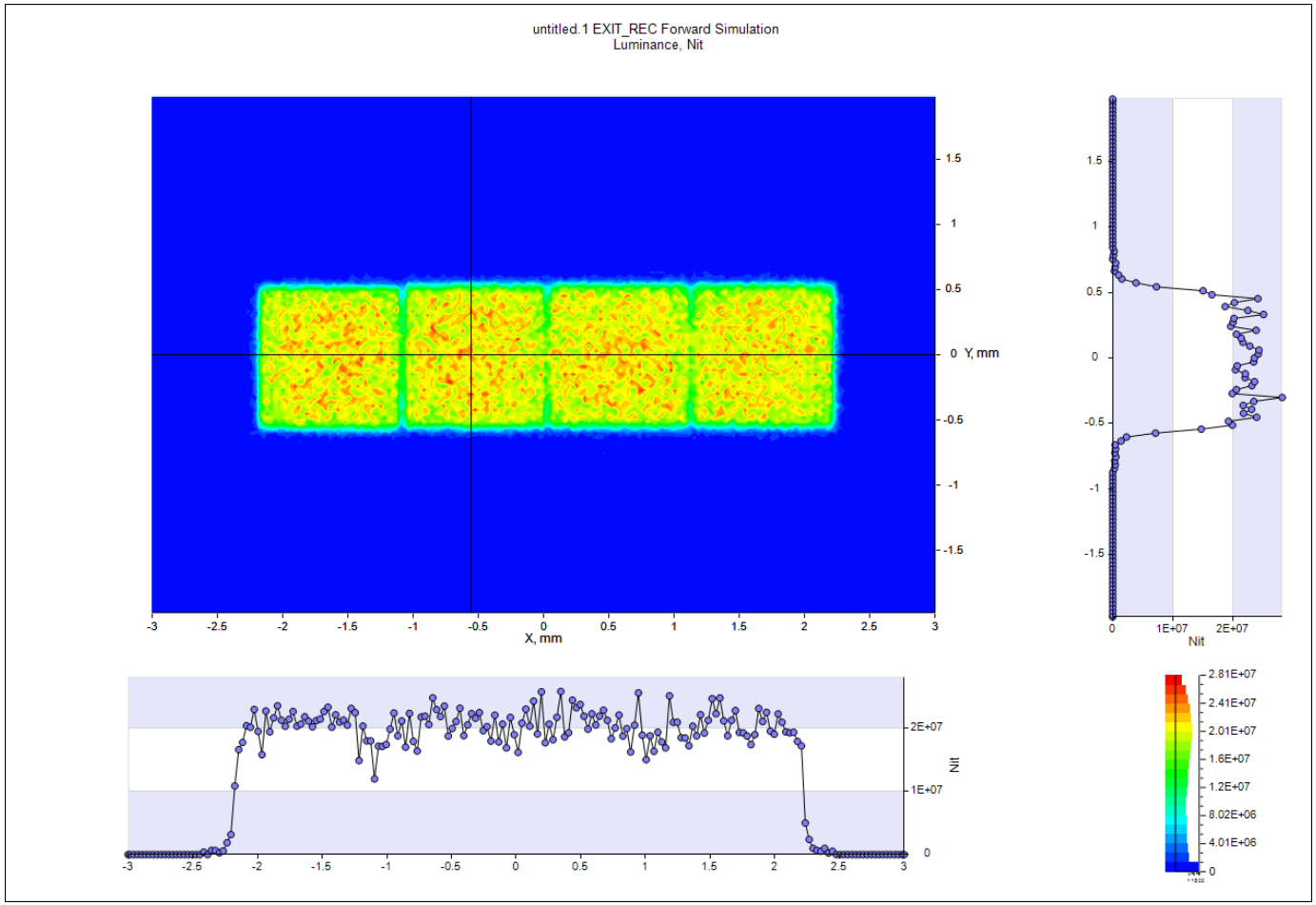
3D CAD view + ray starting points



LUXEON Go 1x4

photometric data taken from LUXEON Altilon TopContact 1x4 Gen6

Source Size

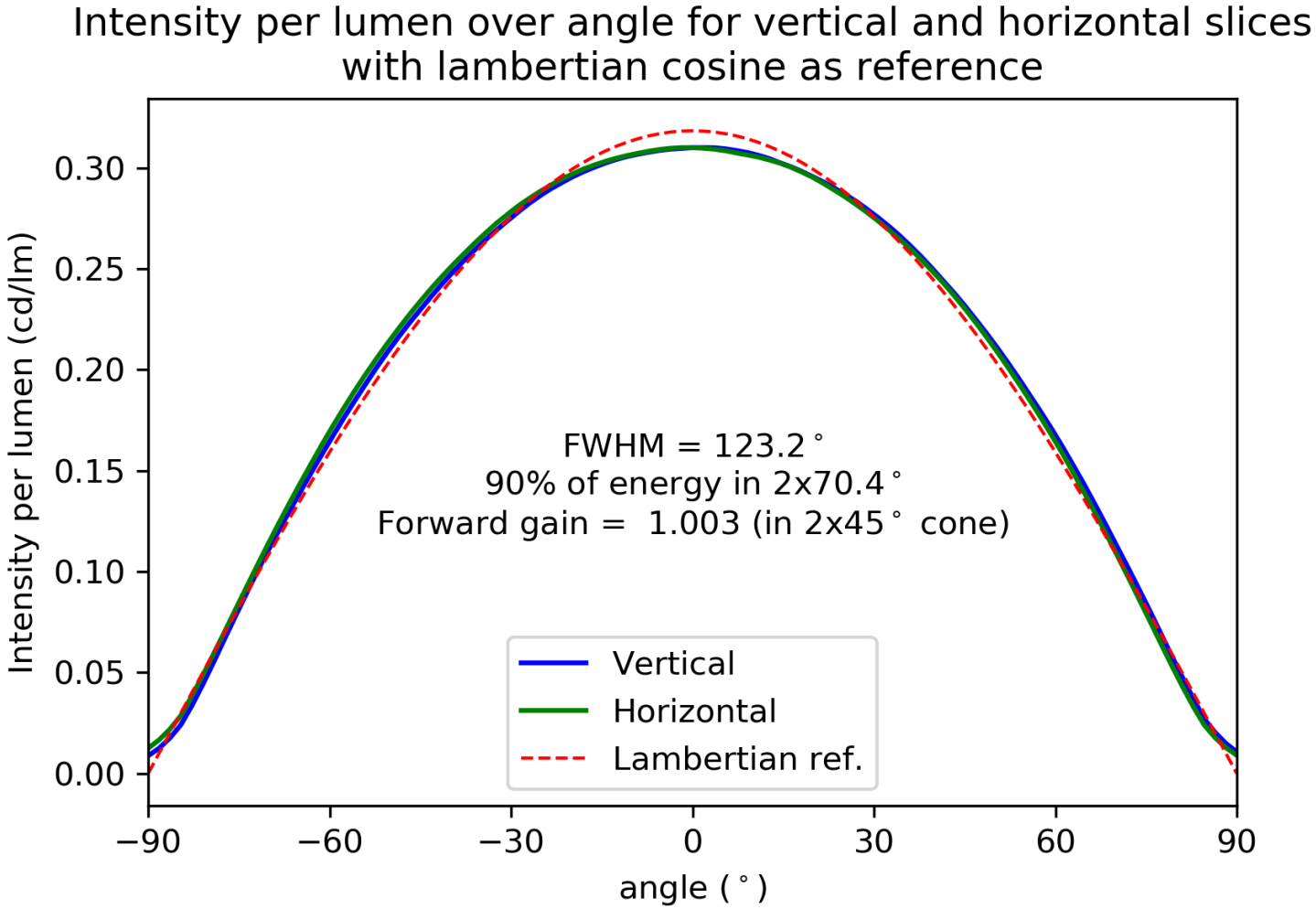


The two orthogonal lines in the luminance image mark the reference planes of the two luminance cross sections.

LUXEON Go 1x4

photometric data taken from LUXEON Altilon TopContact 1x4 Gen6

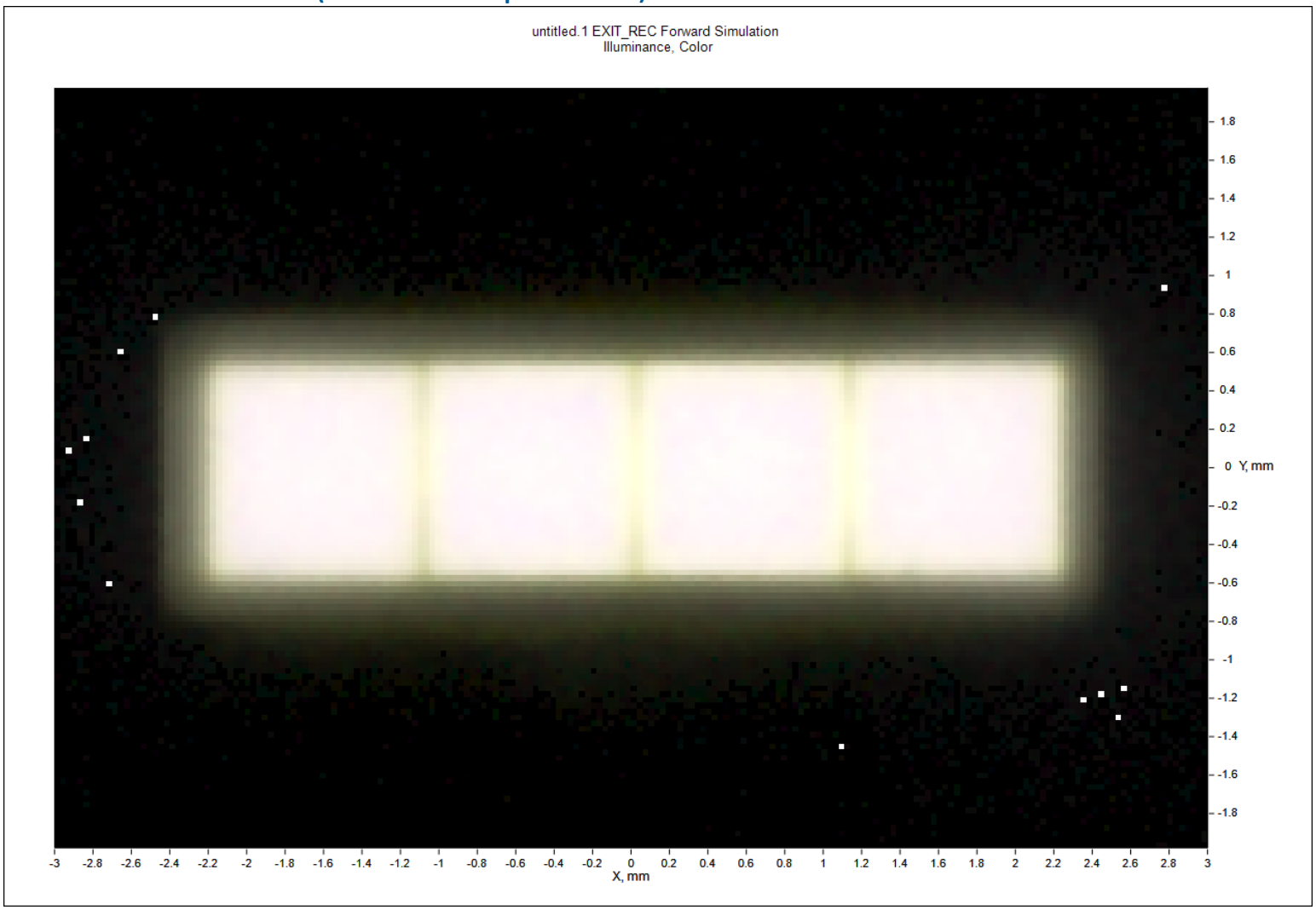
Luminous Intensity Distribution



LUXEON Go 1x4

photometric data taken from LUXEON Altilon TopContact 1x4 Gen6

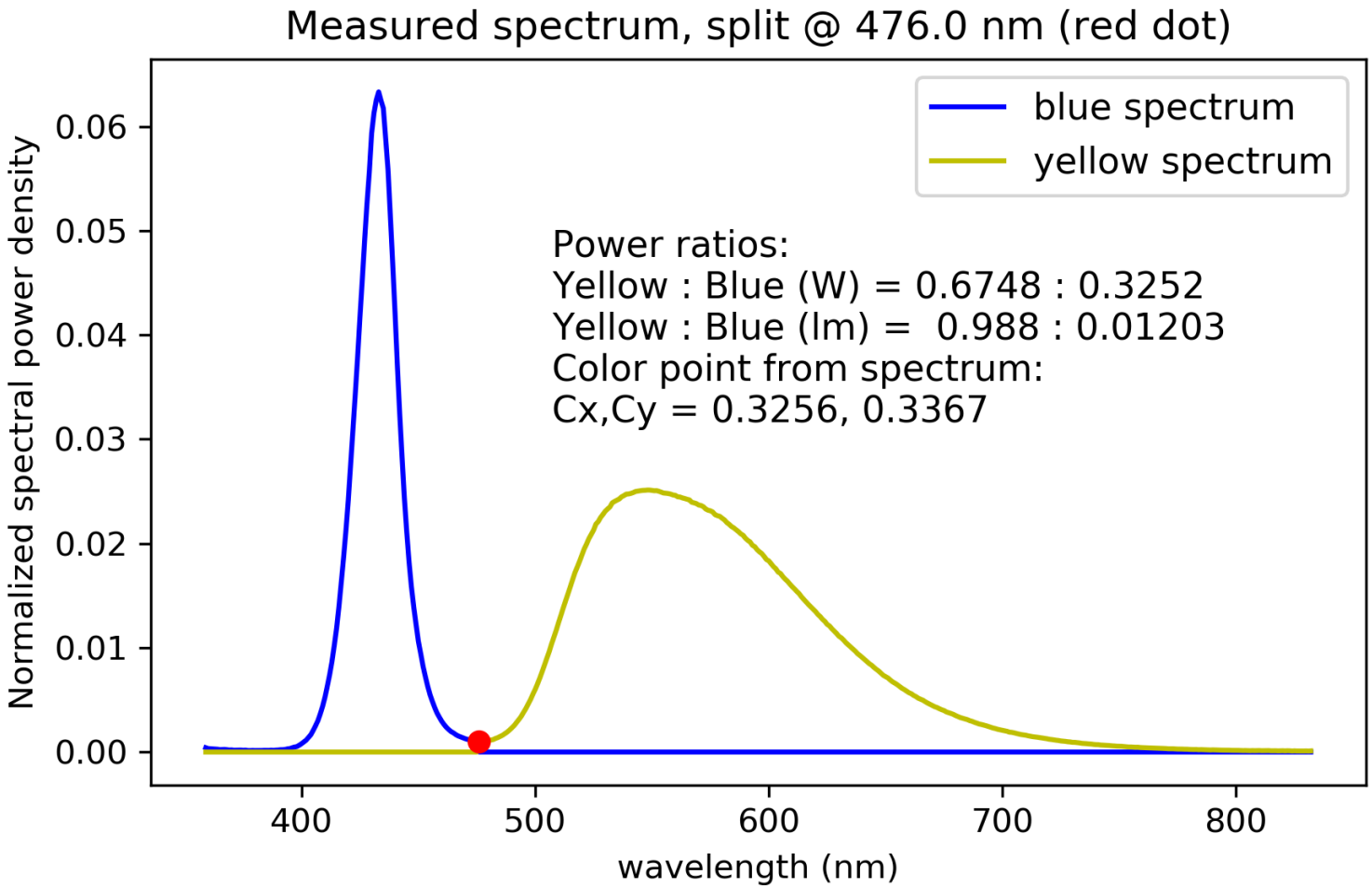
Illuminance color chart (color over position)



LUXEON Go 1x4

photometric data taken from LUXEON Altilon TopContact 1x4 Gen6

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



LUXEON Go 1x4

photometric data taken from LUXEON Altilon TopContact 1x4 Gen6

Color data info

Parameter	Value
yellow : blue ratio (W) (from measured spectrum)	0.6748 : 0.3252
yellow : blue ratio (lm) (from measured spectrum)	0.988 : 0.01203
Average color point Cx, Cy (from measured spectrum)	0.3256, 0.3367
Average color point Cx, Cy (from simulation)	0.3255, 0.3387
Color point Cx, Cy @ HV (from simulation)	0.3246, 0.3375
Average CCT (K) (from simulation)	5.818e+03

Download File Nomenclature (see next slide)

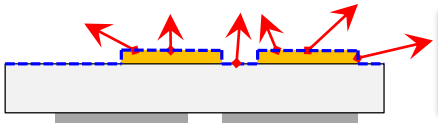
Example

LUXEON_Altilon_SMD2_1x4_gen4plus_20190206_20Mray_proj_Z_spectral_LT.ray

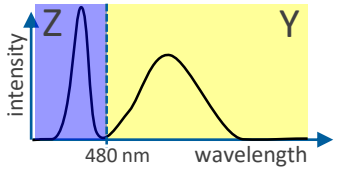
Product Name

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 ref.: C26_LUXEON Altilon TopContact 1x4 Gen6_20200310

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