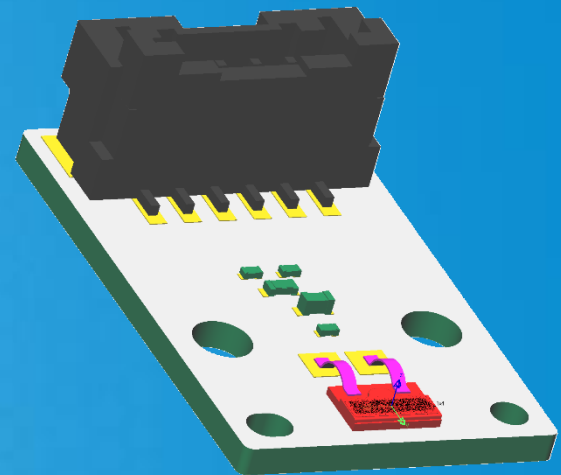


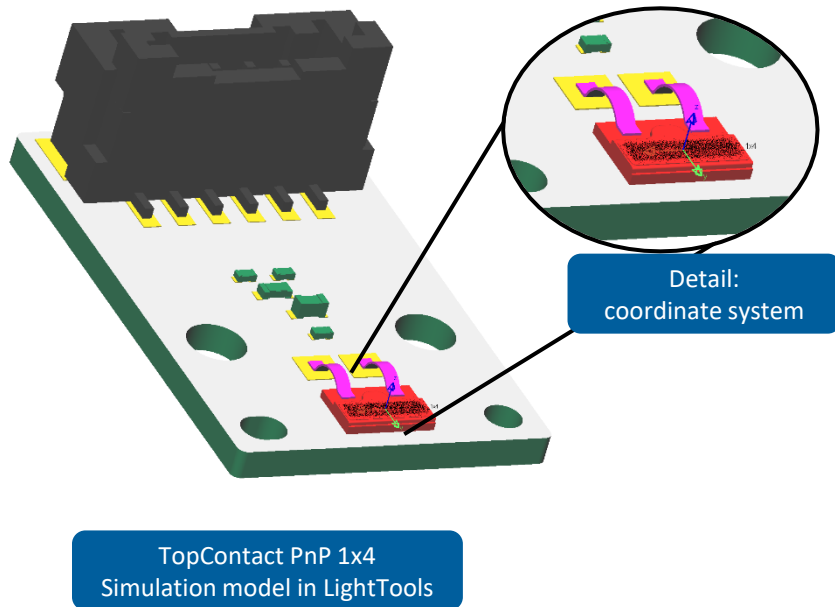
# LUXEON Altilon TopContact PnP 1x4

## Optical Rayset Readme

March,5th, 2021



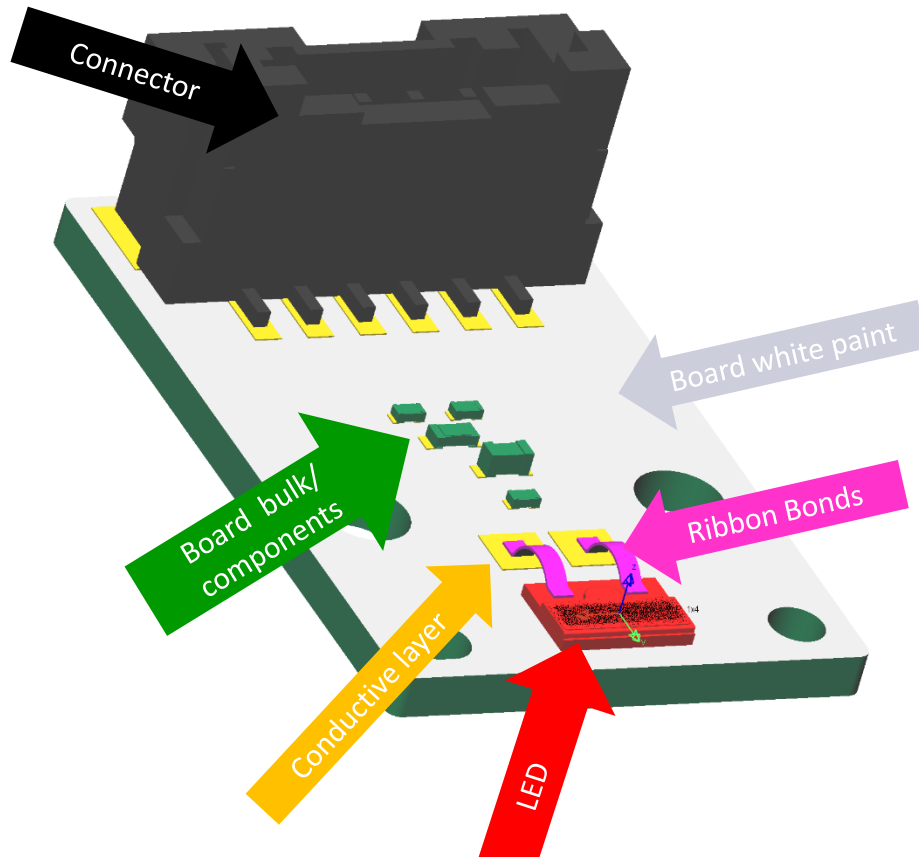
# LUXEON Altilon TopContact PnP 1x4



## 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 module 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 module we recommend to build a ray tracing model of the module from this CAD. Recommended model properties are described on the page: 'Model for Ray-Tracing' in this documentation

## LUXEON Alticon TopContact PnP 1x4



Simulation model of module with recommended optical surface properties shown in false colors  
LUXEON Alticon TopContact PnP 1x4  
as example

### Model for Ray-Tracing

- We recommend to include the module geometry into ray-tracing when designing with LUXEON Alticon TopContact PnP. This provides consideration of any stray light paths in the system interfering with the module.
- The table indicates practical optical properties for simulation of the module 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

# LUXEON Altilon TopContact PnP 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
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### 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
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### Far Field

IES	LUXEON_Altilon_TopContact_1x4_20200310_40MRays.ies	10.6 kB
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### Spectrum

Spectrum	LUXEON_Altilon_TopContact_1x4_20200310_spectrum.txt	10.2 kB
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# LUXEON Altilon TopContact PnP 1x4 (CAD Module)

Link to download folder

<https://raysets.lumileds.com/index.php/s/dKFotd2b2FyafyN>

Files available for download

## STEP module for raytracing

STEP	LUXEON_Altilon_TopContact_PnP_1x4_20210219_geometry.STEP	2 MB
IGS	LUXEON_Altilon_TopContact_PnP_1x4_20210219_geometry.IGS	3 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.

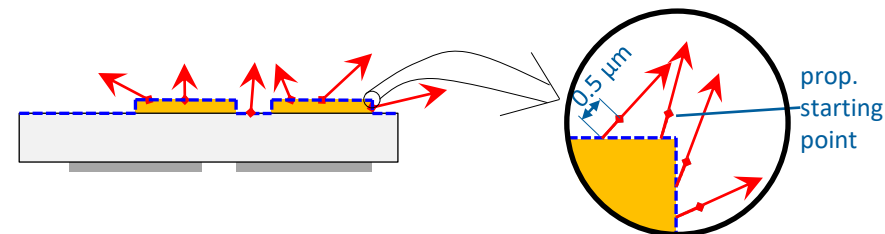
### Projected Raysets: Propagated ray starting points

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  $0.5\ \mu\text{m}$  → 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 Altilon TopContact PnP 1x4

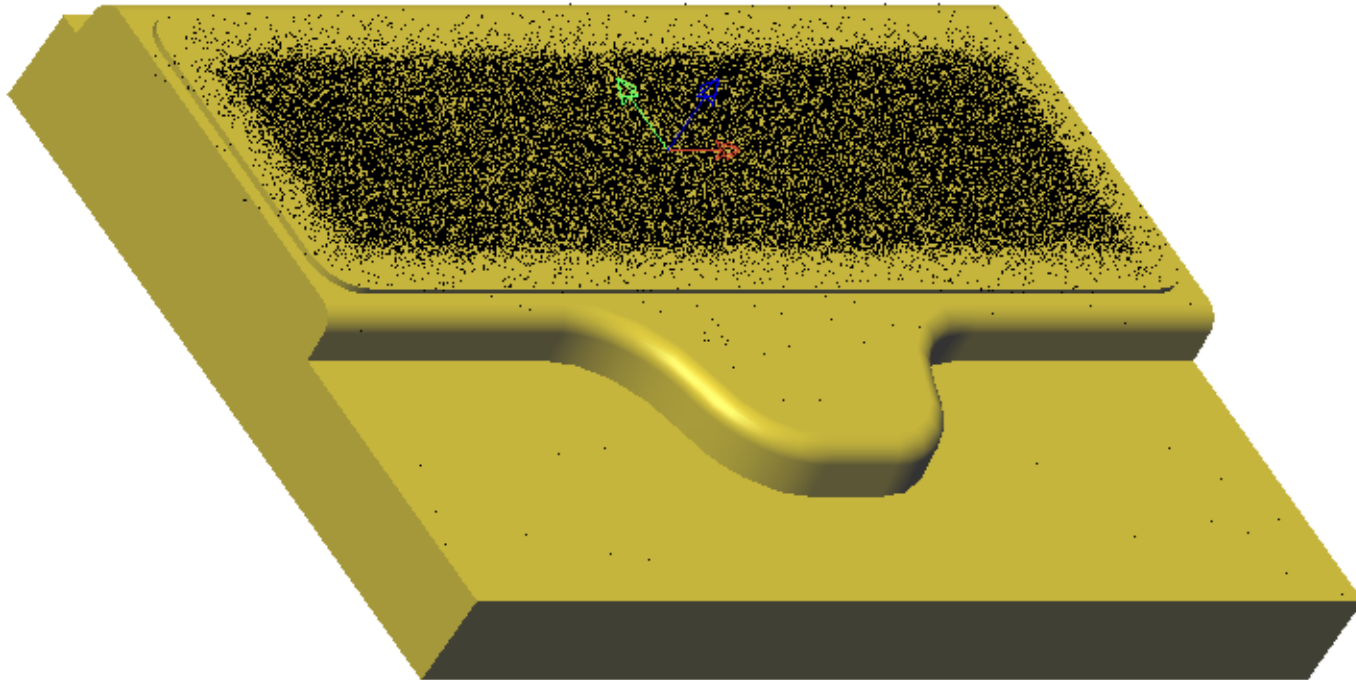
Documentation of photometric data taken from measurement of  
LUXEON Altilon TopContact 1x4



# LUXEON Altilon TopContact PnP 1x4

photometric data taken from LUXEON Altilon TopContact 1x4

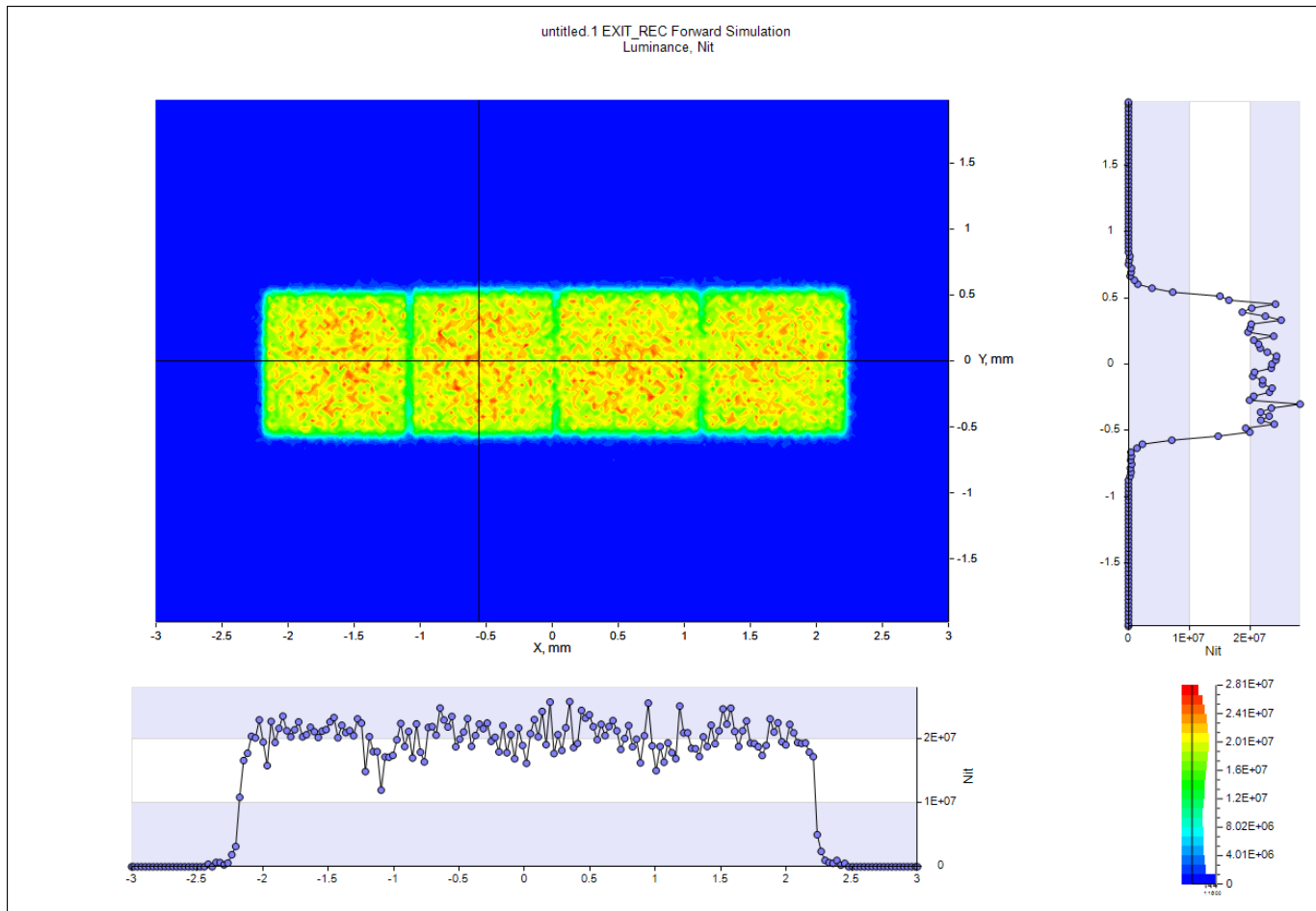
3D CAD view + ray starting points



# LUXEON Altilon TopContact PnP 1x4

photometric data taken from LUXEON Altilon TopContact 1x4

## Source Size



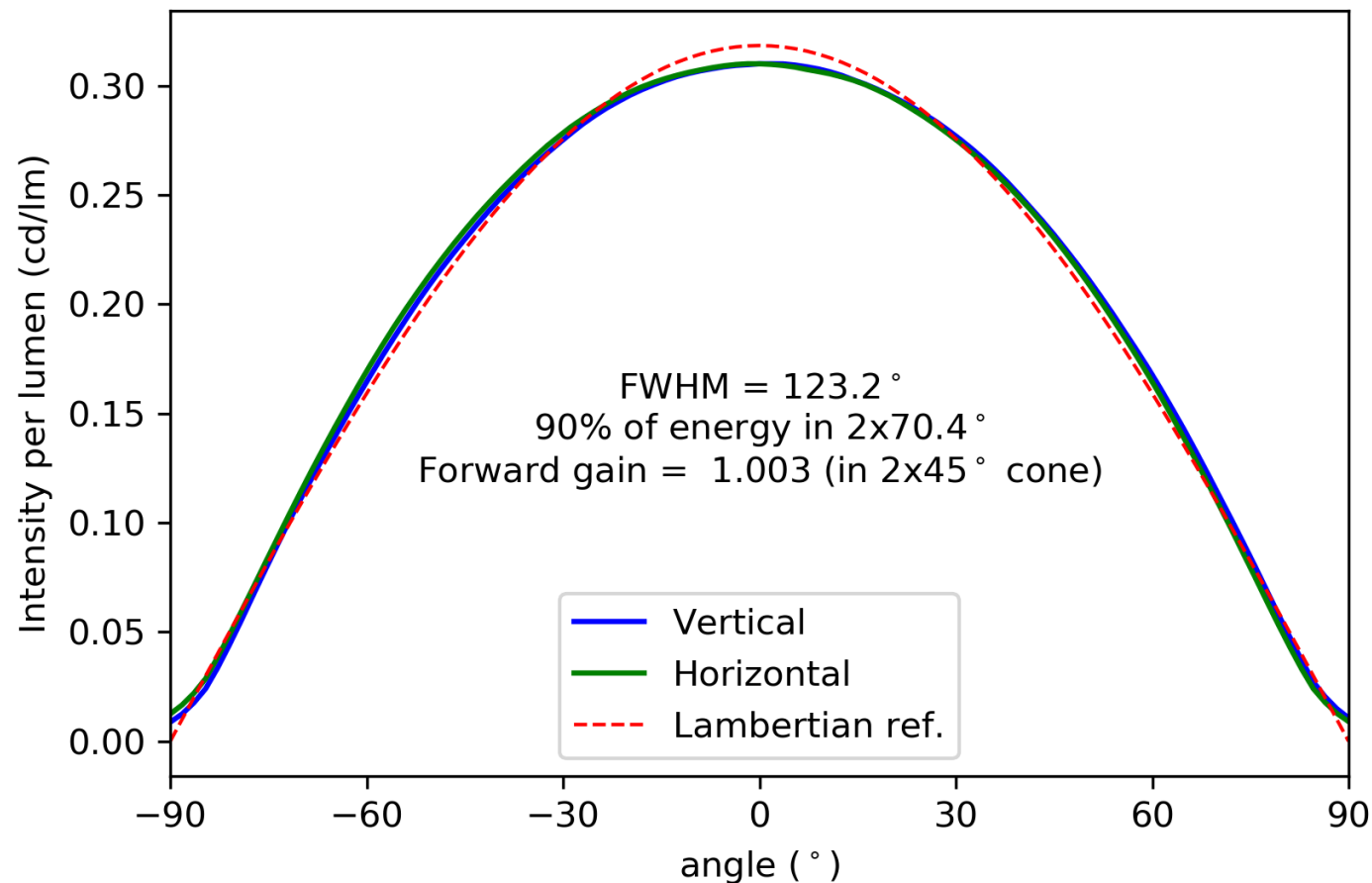
The two orthogonal lines in the luminance image mark the reference planes of the two luminance cross sections.

# LUXEON Altilon TopContact PnP 1x4

photometric data taken from LUXEON Altilon TopContact 1x4

## Luminous Intensity Distribution

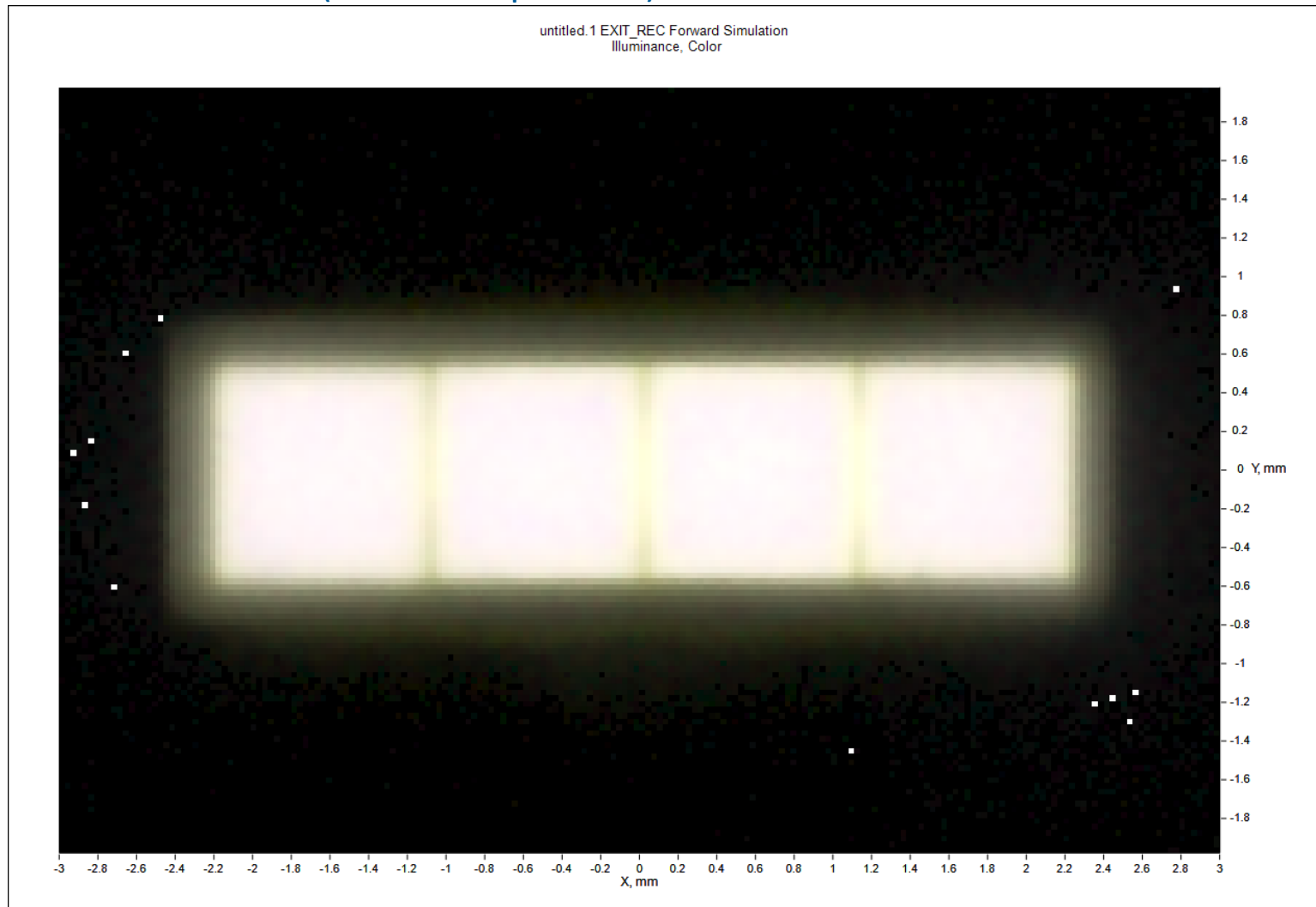
Intensity per lumen over angle for vertical and horizontal slices  
with lambertian cosine as reference



# LUXEON Altilon TopContact PnP 1x4

photometric data taken from LUXEON Altilon TopContact 1x4

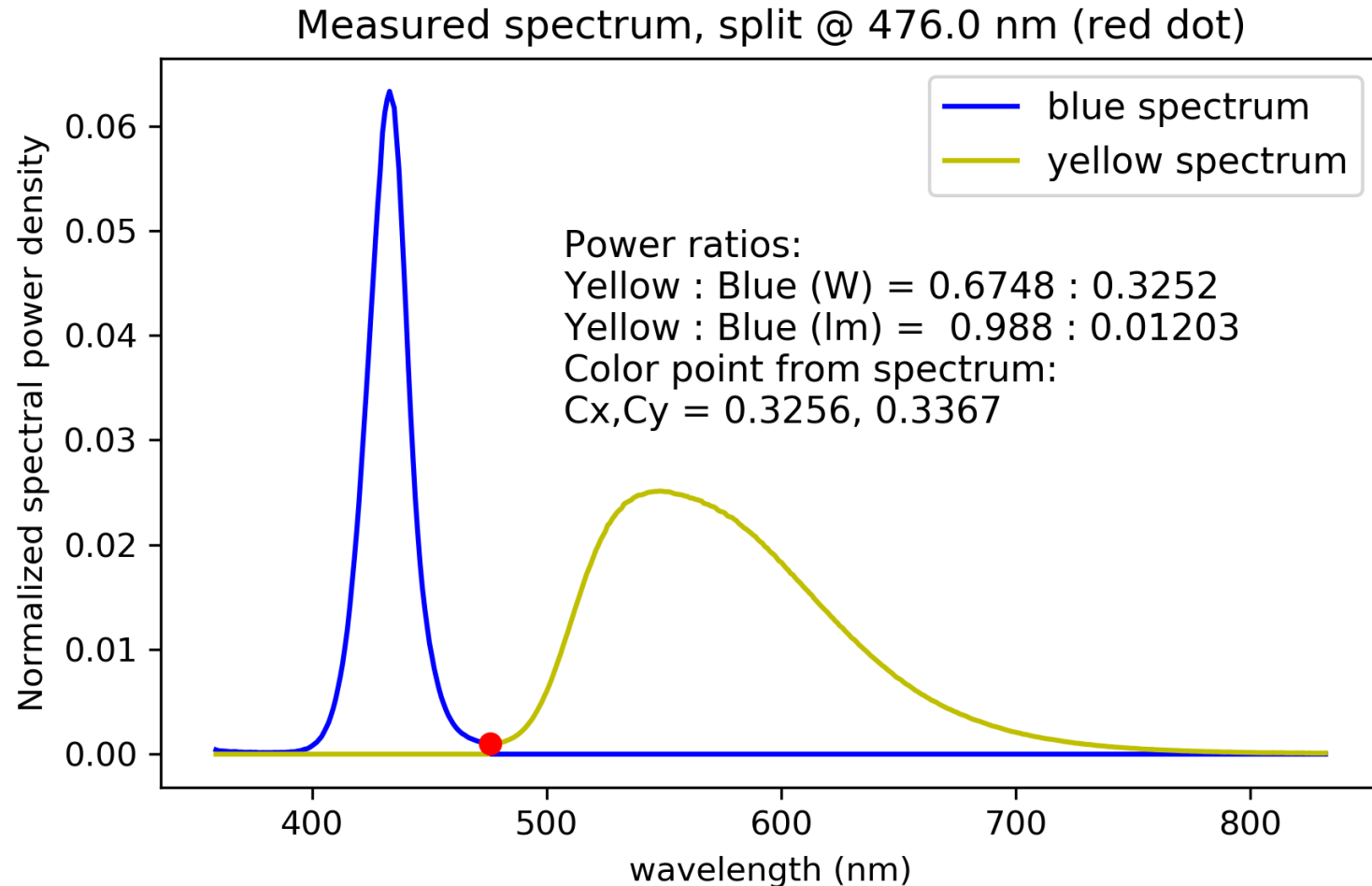
Illuminance color chart (color over position)



# LUXEON Altilon TopContact PnP 1x4

photometric data taken from LUXEON Altilon TopContact 1x4

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



# LUXEON Altilon TopContact PnP 1x4

photometric data taken from LUXEON Altilon TopContact 1x4

## 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 =  $20 \cdot 10^6$  rays

**Ray starting points**

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

**Spectral range**

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

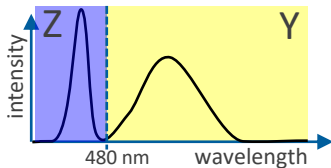
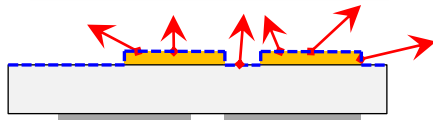
**Spectral Information**

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

**Target Software Package**

LightTools (LT), ASAP, Zemax, ...

**File Extension**



vs.

Lumileds ref.: C35\_LUXEON Altilon TopContact 1x4 PnP\_20210305



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