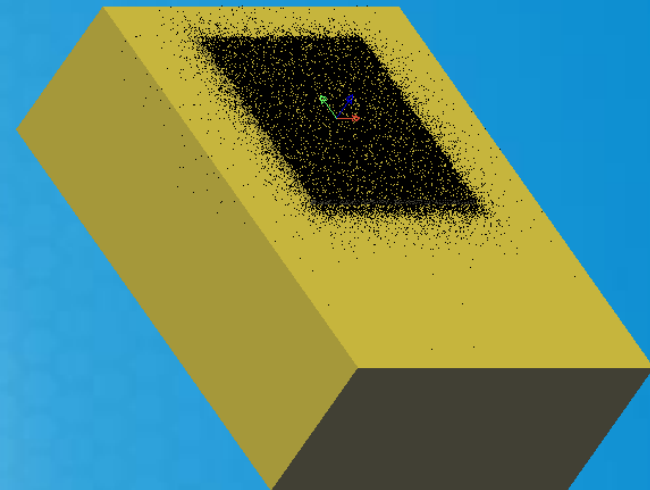


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Optical Rayset Readme

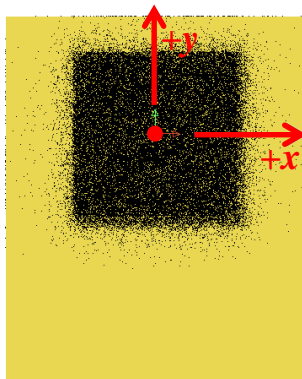
July 24th, 2020



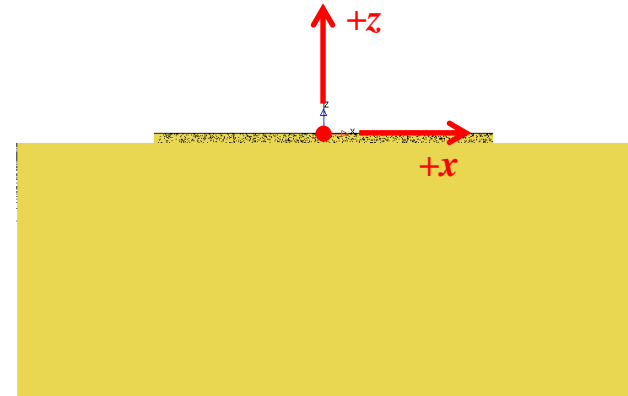
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Coordinate system

Top view



Side view

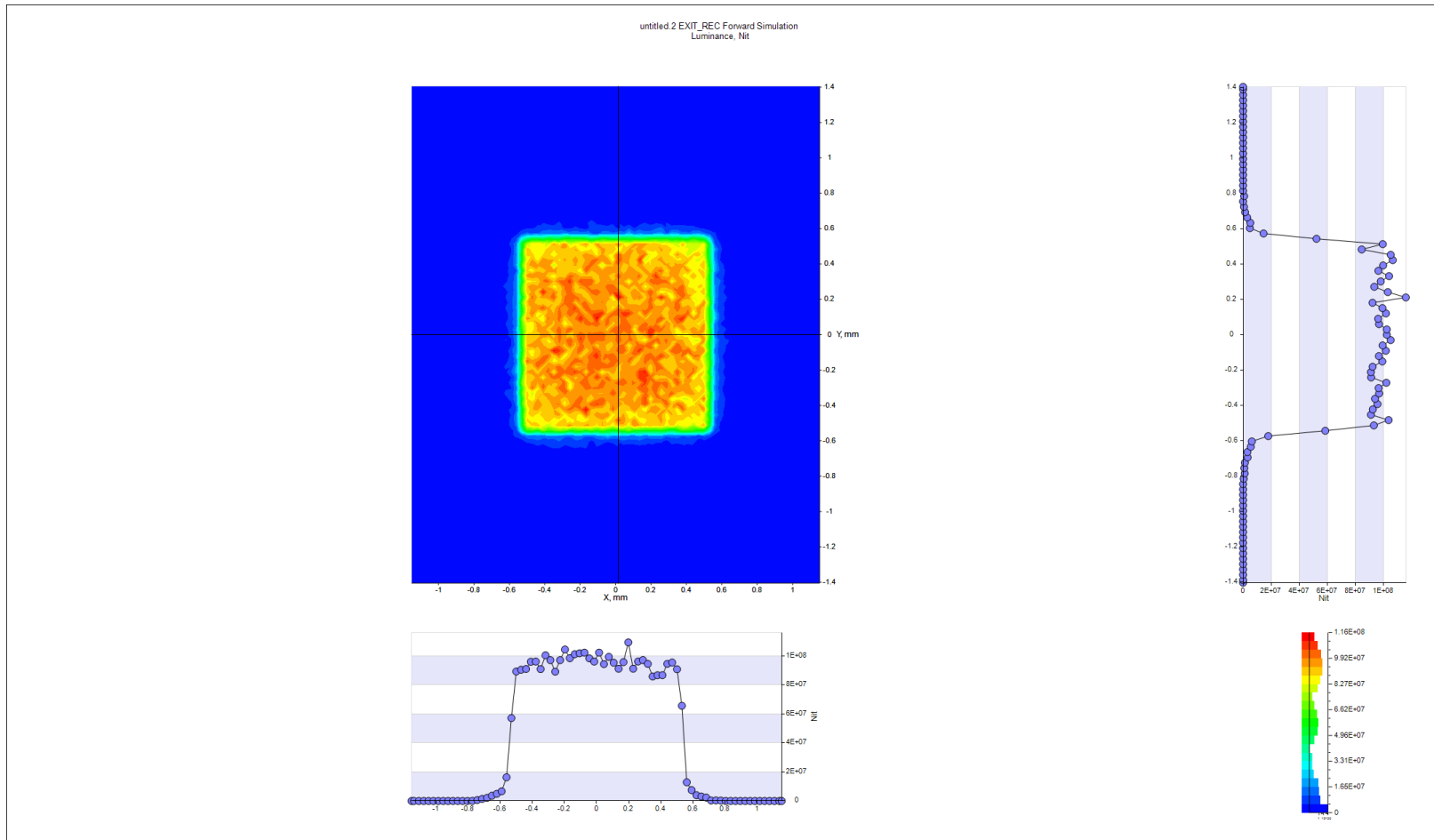


**CAD file and rayset files share the same coordinate system,
the origin is marked by the red dot in the sketches above:**

xy center == center of light emitting area
z=0 plane == top edge of light emitting area

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Source size

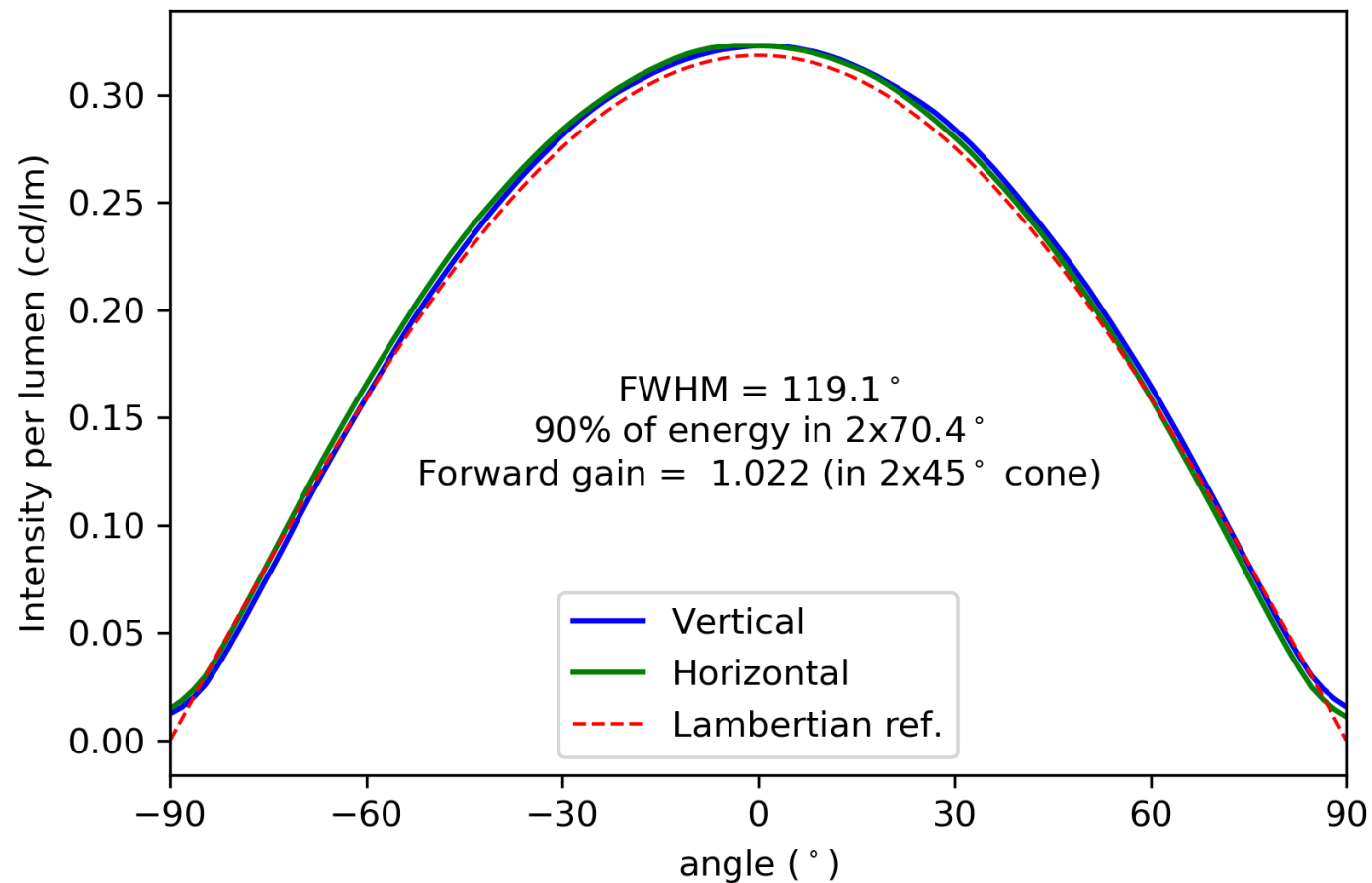


The two orthogonal lines in the luminance image mark the reference planes of the two luminance cross sections.

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Luminous intensity distribution

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



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

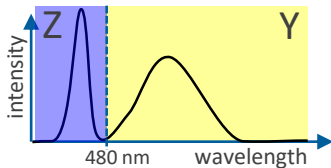
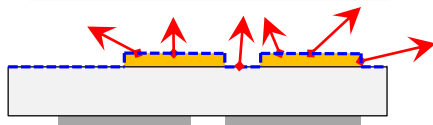
Spectral Information

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

Target Software Package

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

File Extension



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.

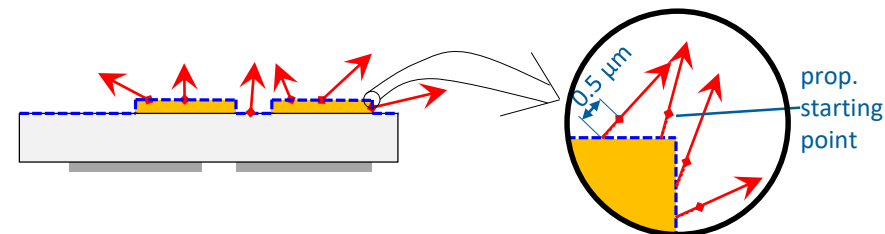
Projected Raysets: Propagated ray starting points

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.



LUXEON FX2 Plus PCA

Link to download folder

<https://raysets.lumileds.com/index.php/s/y4LFQD5YWtGcadd>

Files available for download

LightTools

| | | | |
|-----------------------|---|---------|---------|
| Spectral Projected | C23_LUXEON_FX2_Plus_PCA_20200724_40MRays_proj_spectral_LT.ray | 1.19 GB | 40MRays |
| Y-Component Projected | C23_LUXEON_FX2_Plus_PCA_20200724_20MRays_proj_Y_LT.ray | 534 MB | 20MRays |
| Z-Component Projected | C23_LUXEON_FX2_Plus_PCA_20200724_20MRays_proj_Z_LT.ray | 534 MB | 20MRays |

ASAP & LucidShape

| | | | |
|-----------------------|--|--------|---------|
| Y-Component Projected | C23_LUXEON_FX2_Plus_PCA_20200724_20MRays_proj_Y_ASAP.dis | 534 MB | 20MRays |
| Z-Component Projected | C23_LUXEON_FX2_Plus_PCA_20200724_20MRays_proj_Z_ASAP.dis | 534 MB | 20MRays |

OPTIS SPEOS

| | | | |
|--------------------------------|--|--------|---------|
| Y-Component Spectral Projected | C23_LUXEON_FX2_Plus_PCA_20200724_20MRays_proj_Y_spectral_Speos.ray | 610 MB | 20MRays |
| Z-Component Spectral Projected | C23_LUXEON_FX2_Plus_PCA_20200724_20MRays_proj_Z_spectral_Speos.ray | 610 MB | 20MRays |

Zemax

| | | | |
|--------------------|--|---------|---------|
| Spectral Projected | C23_LUXEON_FX2_Plus_PCA_20200724_40MRays_proj_spectral_zemax.dat | 1.19 GB | 40MRays |
|--------------------|--|---------|---------|

Far Field

| | | | |
|-----|--|---------|--|
| IES | C23_LUXEON_FX2_Plus_PCA_20200724_40MRays.ies | 10.7 kB | |
|-----|--|---------|--|

Spectrum

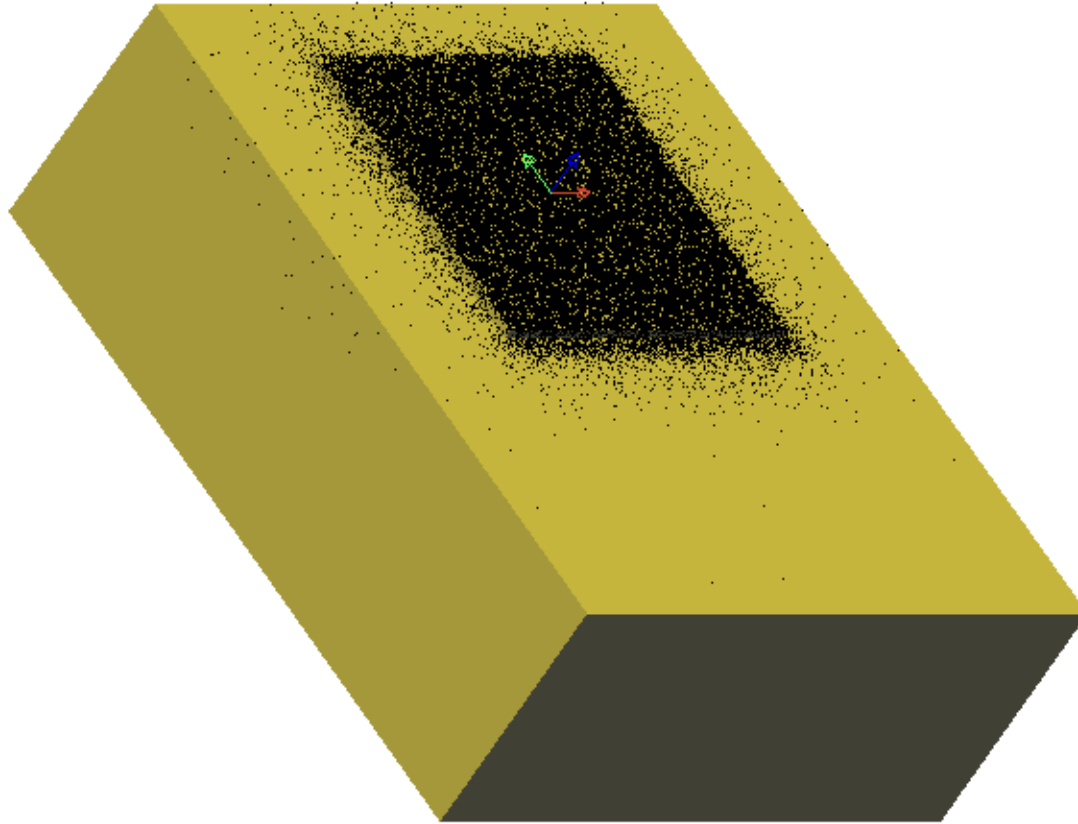
| | | | |
|----------|---|---------|--|
| Spectrum | C23_LUXEON_FX2_Plus_PCA_20200724_spectrum.txt | 10.2 kB | |
|----------|---|---------|--|

CAD

| | | | |
|------|--|--------|--|
| STEP | C23_LUXEON_FX2_Plus_PCA_20200724_geometry.STEP | 108 kB | |
| IGES | C23_LUXEON_FX2_Plus_PCA_20200724_geometry.IGS | 101 kB | |

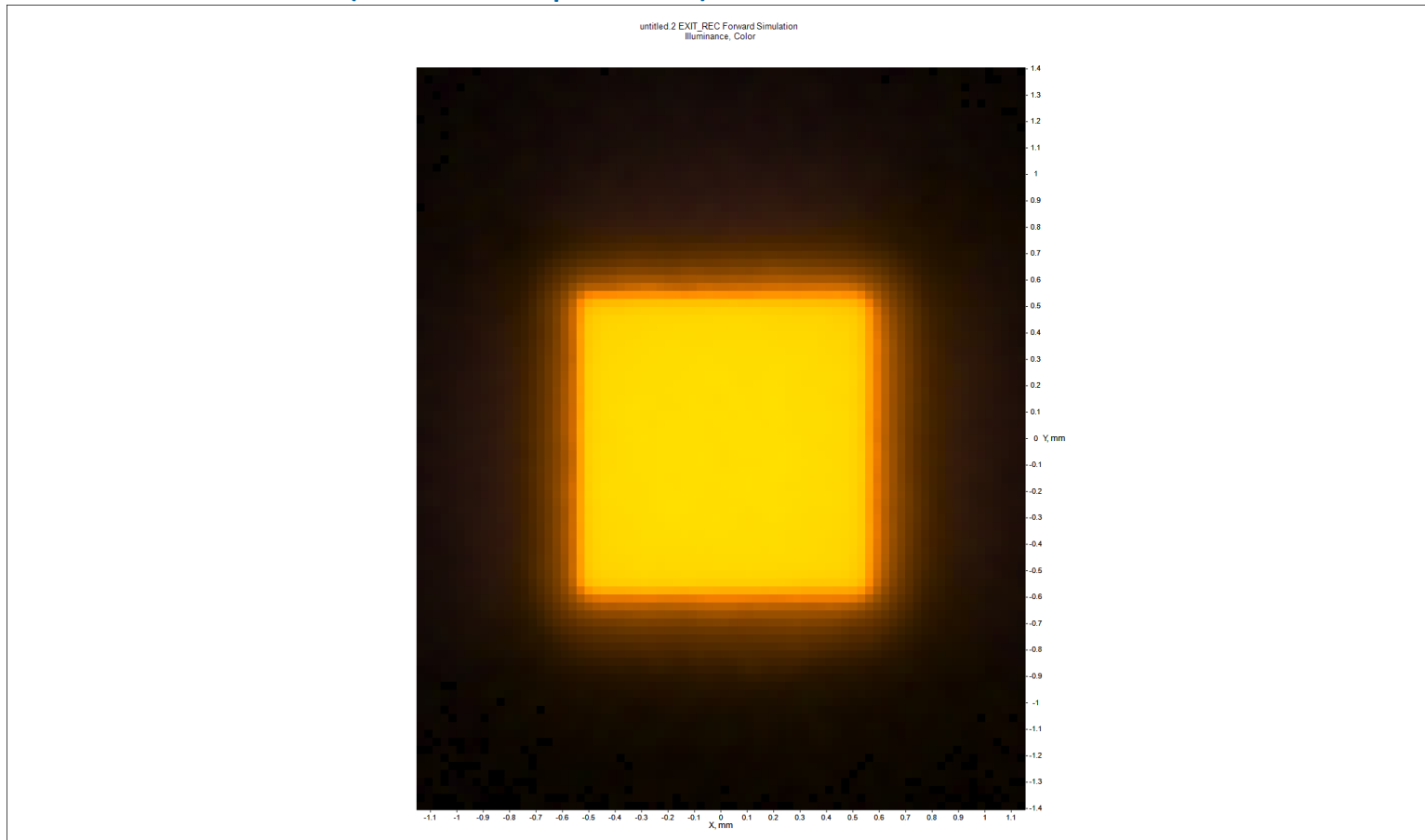
LUXEON FX2 Plus PCA

3D CAD view + ray starting points



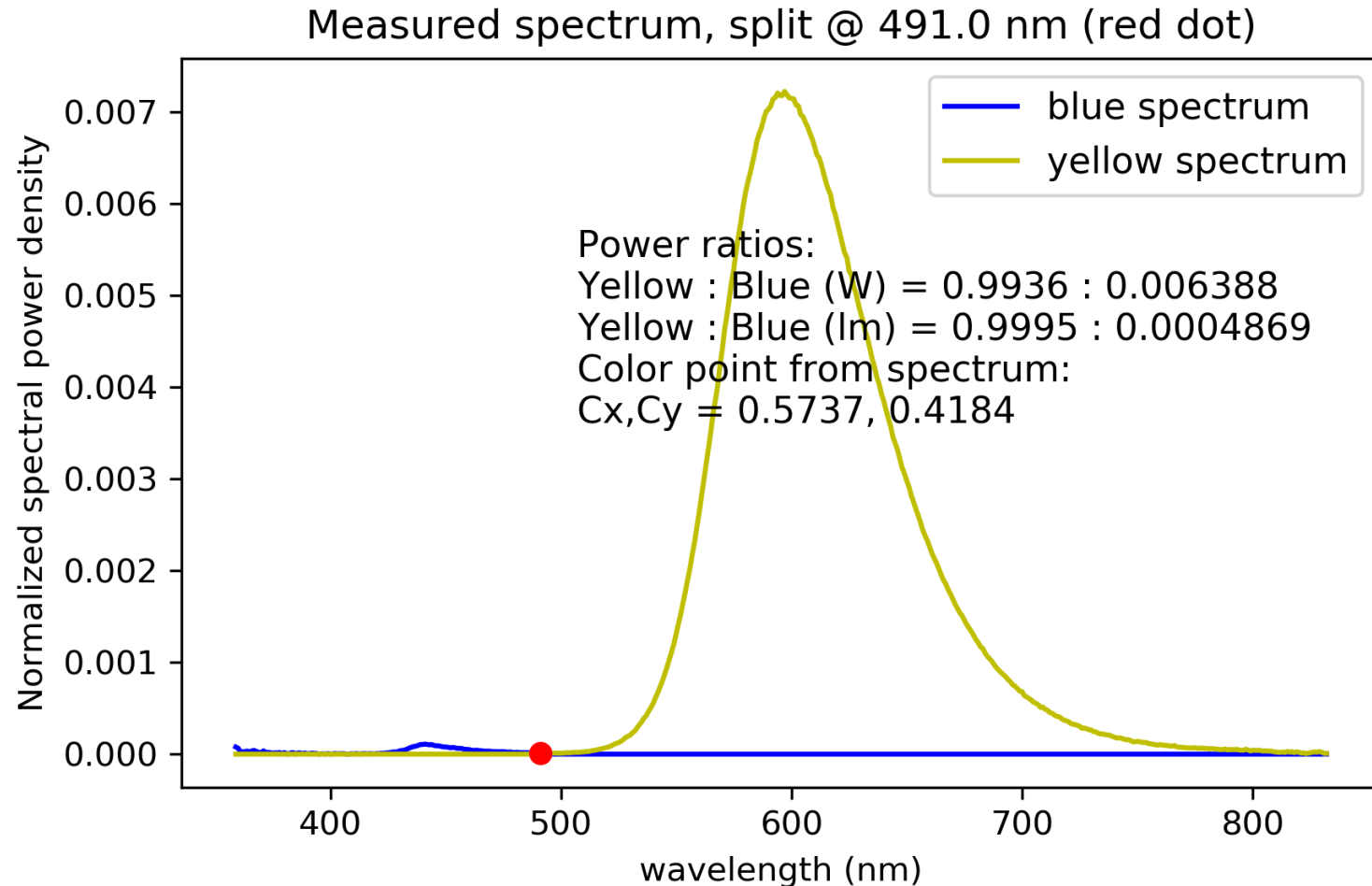
LUXEON FX2 Plus PCA

Illuminance color chart (color over position)



LUXEON FX2 Plus PCA

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



LUXEON FX2 Plus PCA

Color data info

| Parameter | Value |
|--|--------------------|
| yellow : blue ratio (W) (from measured spectrum) | 0.9936 : 0.006388 |
| yellow : blue ratio (lm) (from measured spectrum) | 0.9995 : 0.0004869 |
| Average color point Cx, Cy (from measured spectrum) | 0.5737, 0.4184 |
| Average color point Cx, Cy (from simulation) | 0.5724, 0.4198 |
| Color point Cx, Cy @ HV (from simulation) | 0.5717, 0.4201 |
| Average CCT (K) (from simulation) | 1.712e+03 |

Lumileds ref.: C23_LUXEON FX2 Plus PCA_20200724



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