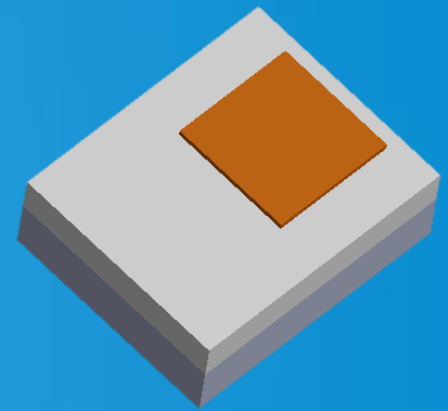
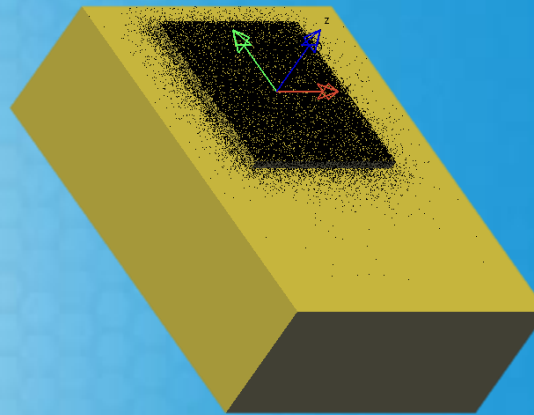


# LUXEON FX Plus PC Amber Optical Rayset Readme

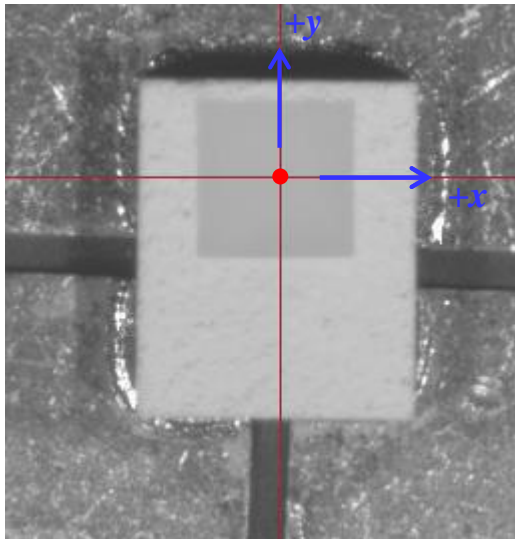
2017 May 11



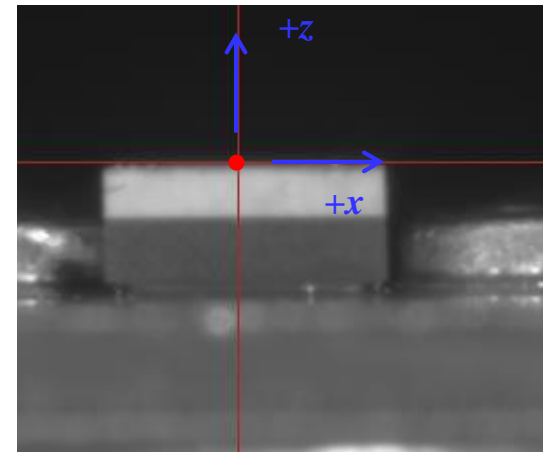
# LUXEON FX Plus PC Amber

## Measurement Reference Location

Top view



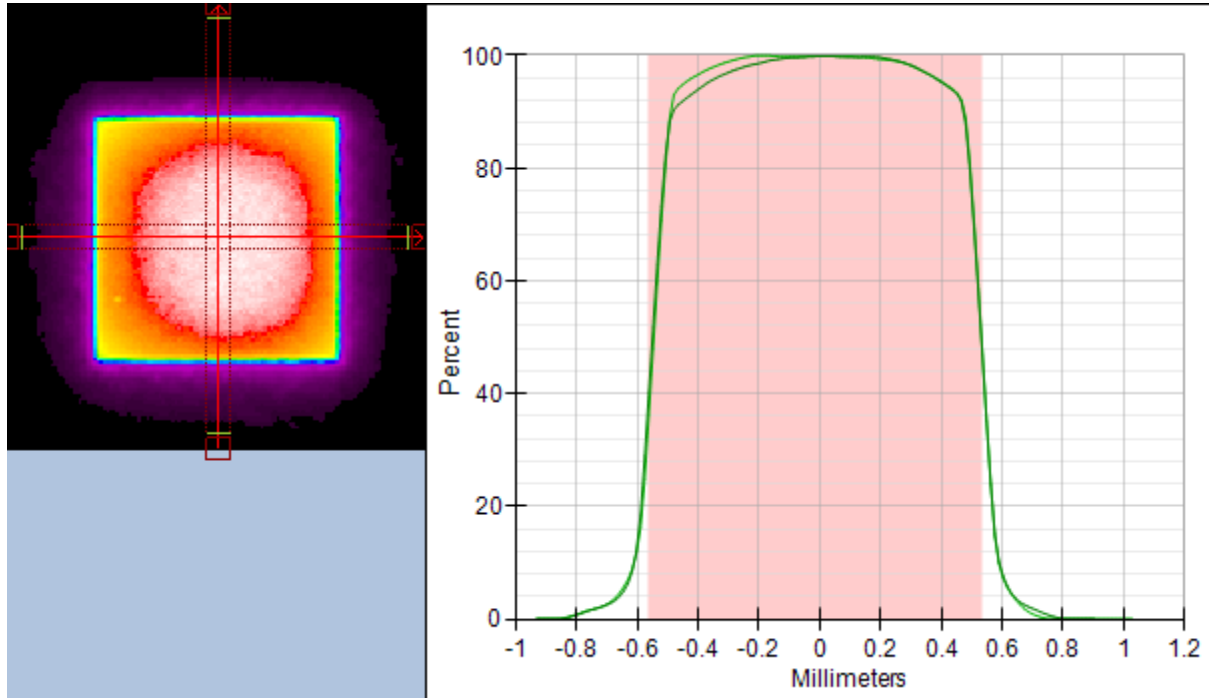
Side view



- xy centered on center of lumiramic phosphor area
- z-axis referenced to top flat edge

# LUXEON FX Plus PC Amber

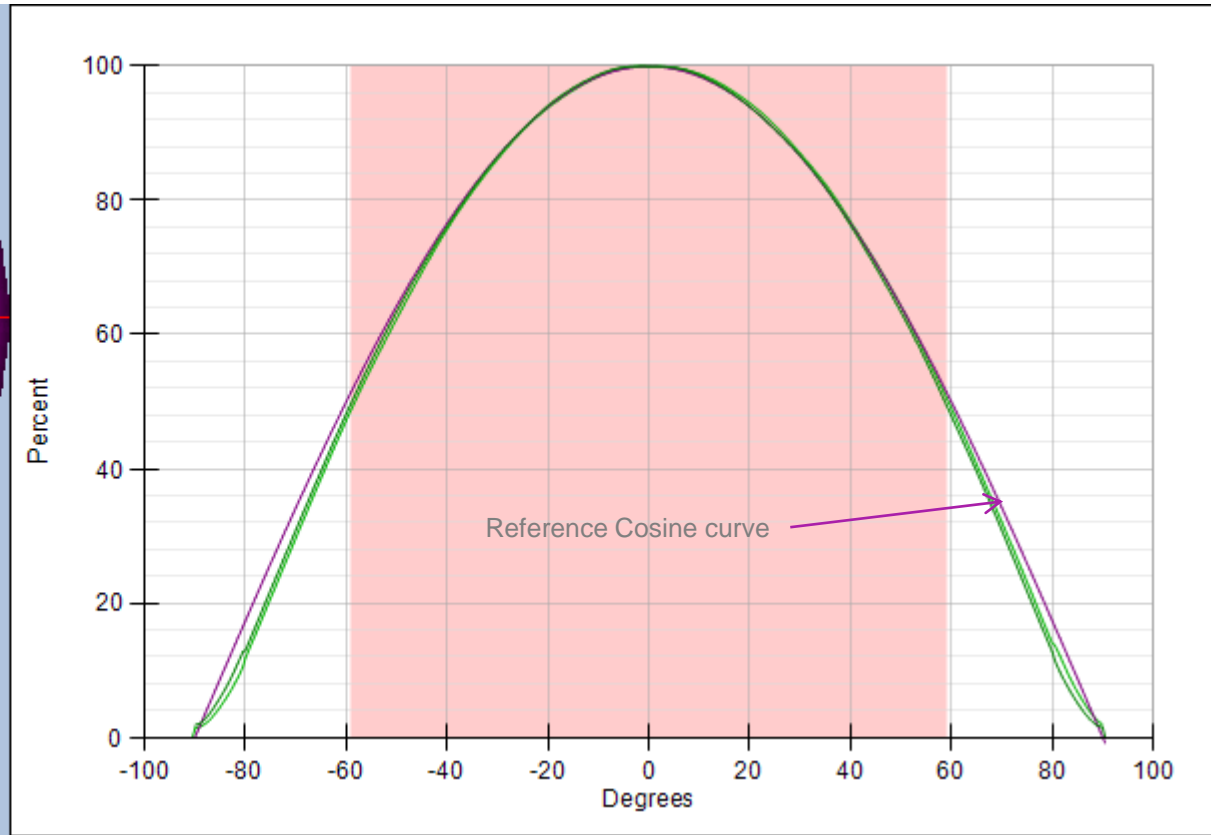
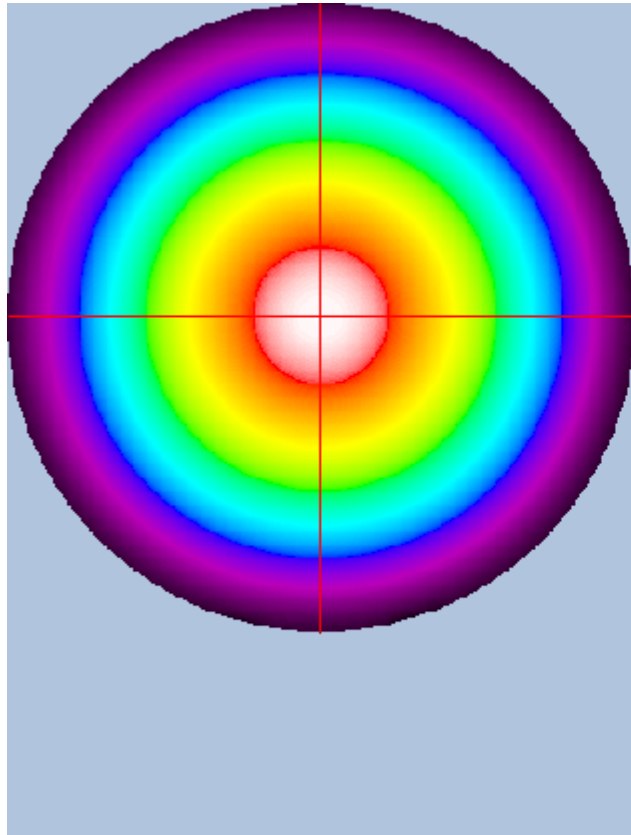
## Source Size



Source luminance (FWHM) = 1.09 x 1.09 mm<sup>2</sup>

# LUXEON FX Plus PC Amber

## Radiation Pattern

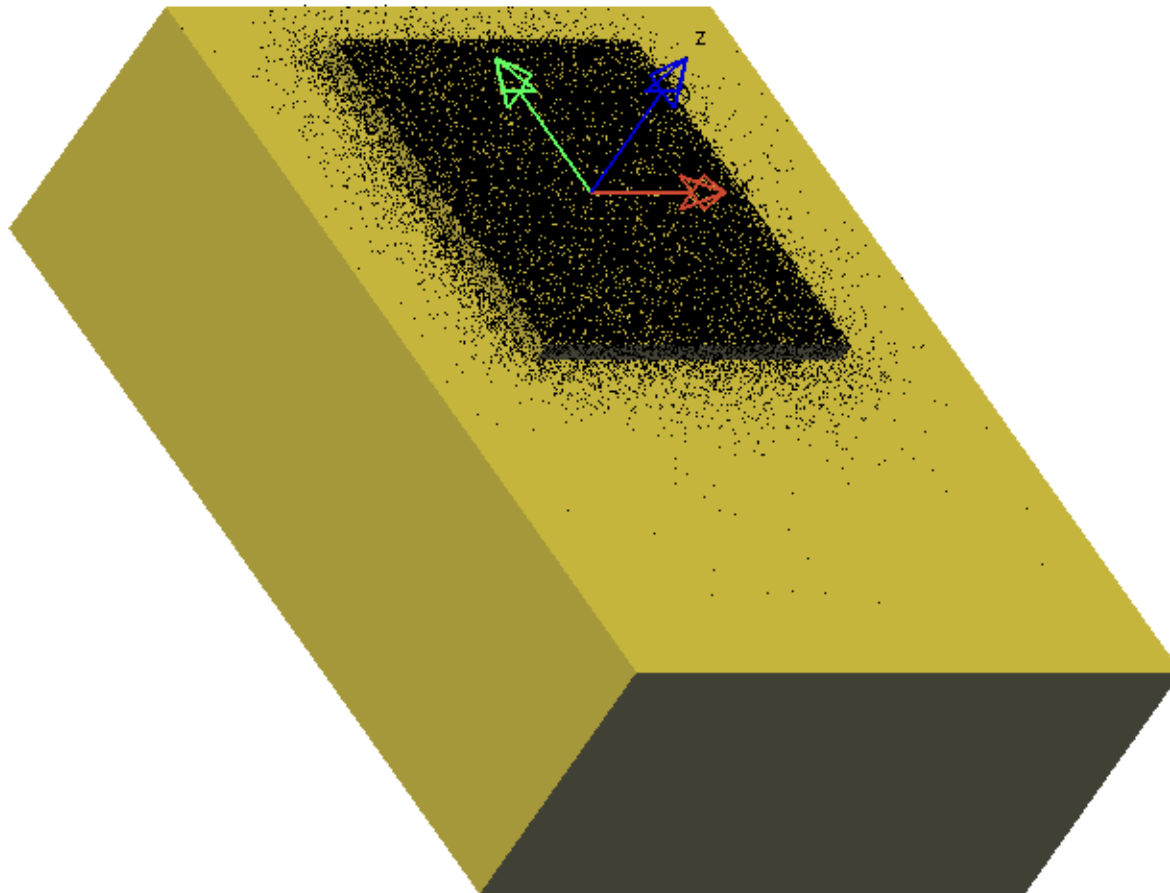


# LUXEON FX Plus PC Amber

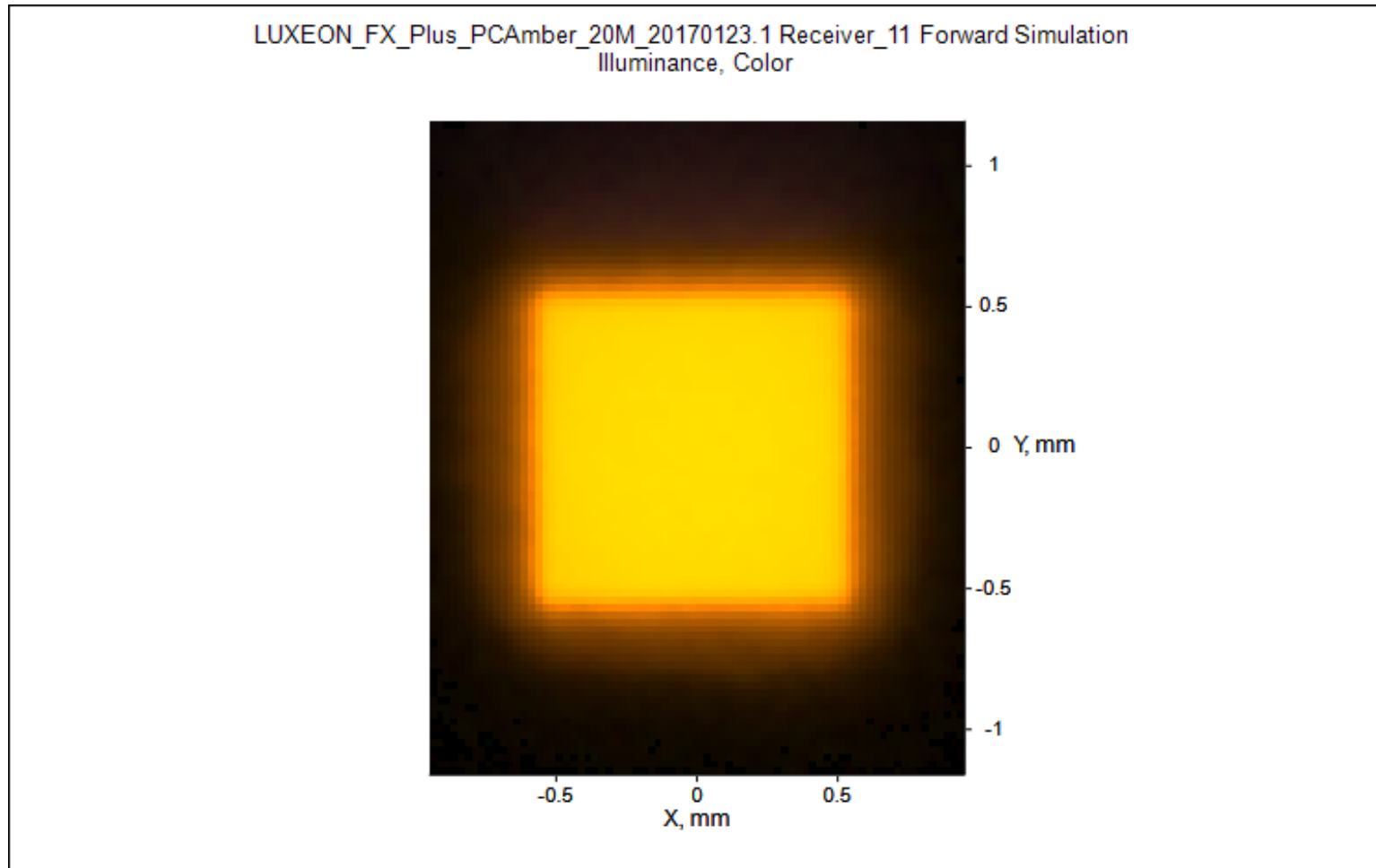
## Rayset Download Links

<b>ProSource</b>		LUXEON_FX_Plus_PCAmber_20170123.rs8 Download link: <a href="https://www.sendspace.com/pro/dl/uuzmq5">https://www.sendspace.com/pro/dl/uuzmq5</a>	136.3 MB	
<b>LightTools</b>	<b>Spectral Projected:</b>	LUXEON_FX_Plus_PCAmber_20M_20170123_proj_spectral_LT.ray Download link: <a href="https://www.sendspace.com/pro/dl/bnwyo7">https://www.sendspace.com/pro/dl/bnwyo7</a>	1.2 GB	20M
<b>ASAP / LucidShape</b>	<b>Projected:</b>	LUXEON_FX_Plus_PCAmber_20M_20170123_proj.dis Download link: <a href="https://www.sendspace.com/pro/dl/7uje5t">https://www.sendspace.com/pro/dl/7uje5t</a>	532.9 MB	20M
<b>OPTIS SPEOS</b>	<b>Projected:</b>	LUXEON_FX_Plus_PCAmber_20M_20170123_proj_Speos.ray Download link: <a href="https://www.sendspace.com/pro/dl/p0p1dy">https://www.sendspace.com/pro/dl/p0p1dy</a>	609.1 MB	20M
<b>Zemax</b>	<b>Spectral Projected:</b>	LUXEON_FX_Plus_PCAmber_20M_20170123_proj_spectral_Zemax.zip Download link: <a href="https://www.sendspace.com/pro/dl/c42jt2">https://www.sendspace.com/pro/dl/c42jt2</a>	1.1 GB	20M
<b>Spectrum</b>		Spectrum__LUXEON_FX_PCAmber__20170130.txt Download link: <a href="https://www.sendspace.com/pro/dl/rl1f9u">https://www.sendspace.com/pro/dl/rl1f9u</a>	13.1 KB	
<b>CAD</b>	<b>STEP:</b>	LUXEON_FX_PCAmber_11242016.STEP Download link: <a href="https://www.sendspace.com/pro/dl/wyqcdx">https://www.sendspace.com/pro/dl/wyqcdx</a>	85.1 KB	
	<b>IGES:</b>	LUXEON_FX_PCAmber_11242016.IGS Download link: <a href="https://www.sendspace.com/pro/dl/rlz629">https://www.sendspace.com/pro/dl/rlz629</a>	191.1 KB	

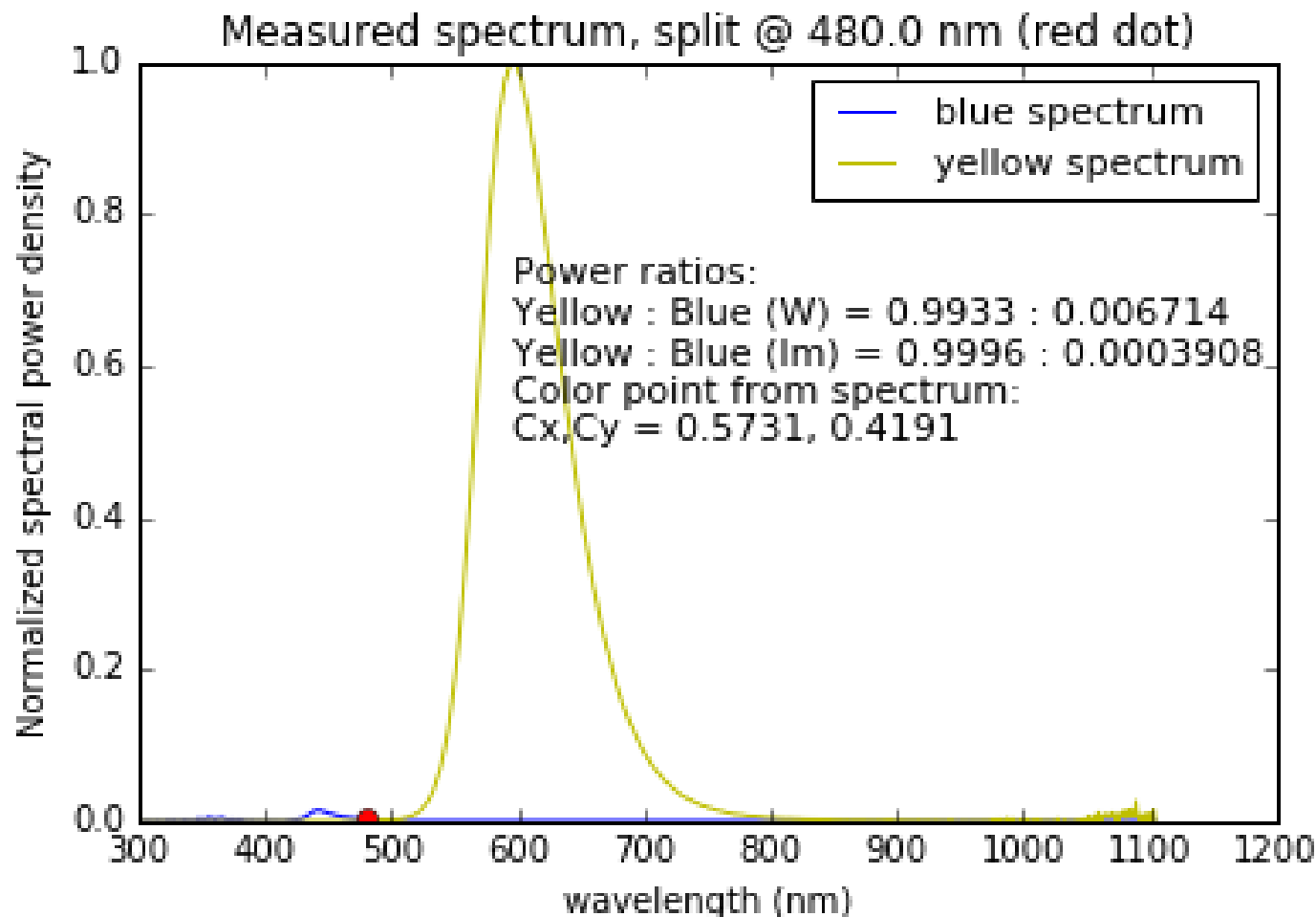
## 3D CAD view + ray starting points



## Illuminance color chart (color over position)



# Measured spectrum split in blue (Z) & yellow (Y) components





## Color data info

Parameter	Value
yellow : blue ratio (W) (from measured spectrum)	0.9933 : 0.006714
yellow : blue ratio (lm) (from measured spectrum)	0.9996 : 0.0003908
Average color point Cx, Cy (from measured spectrum)	0.5731, 0.4191
Average color point Cx, Cy (from simulation)	0.5716, 0.4206
Color point Cx, Cy @ HV (from simulation)	0.5705, 0.4214
Average CCT (K) (from simulation)	1.72e+03

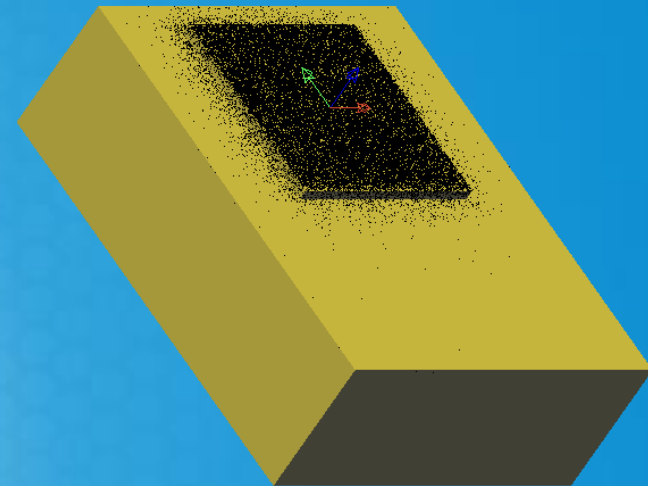


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# LUXEON FX Plus CW - PCN # 2018044

## Optical Rayset Readme

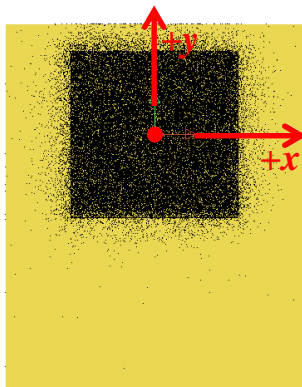
May 7th, 2019



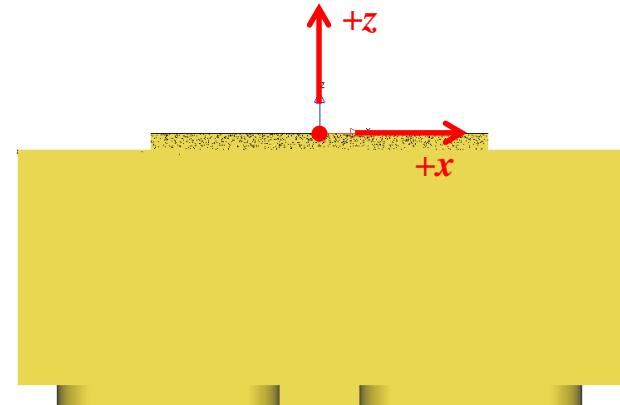
# LUXEON FX Plus CW - PCN # 2018044

## Coordinate System

Top view



Side view

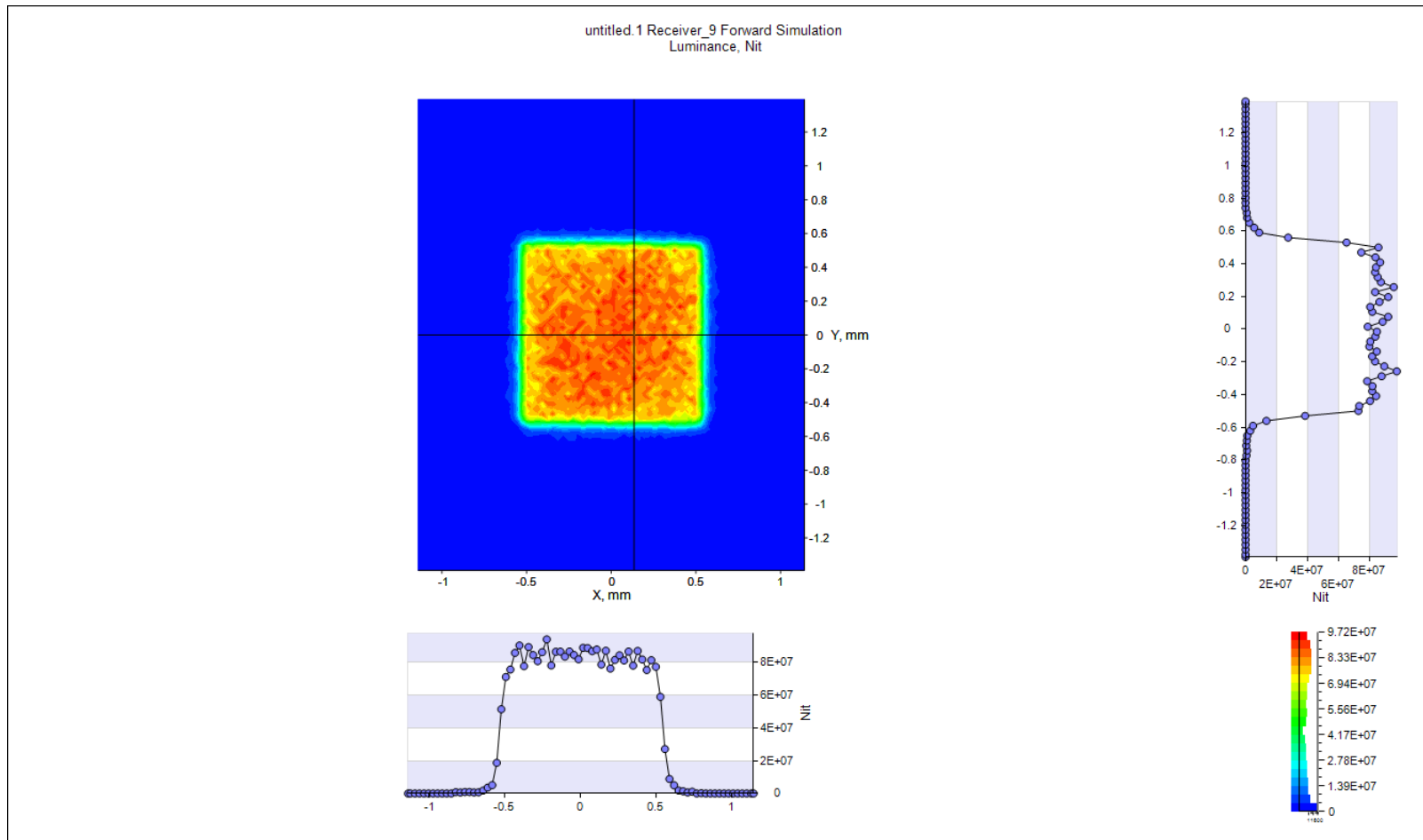


**CAD file and rayset files share the same coordinate system,  
the origin is marked by the red dot in the sketches above:**

xy center	==	center of package
z=0 plane	==	top edge of package

# LUXEON FX Plus CW - PCN # 2018044

## Source Size

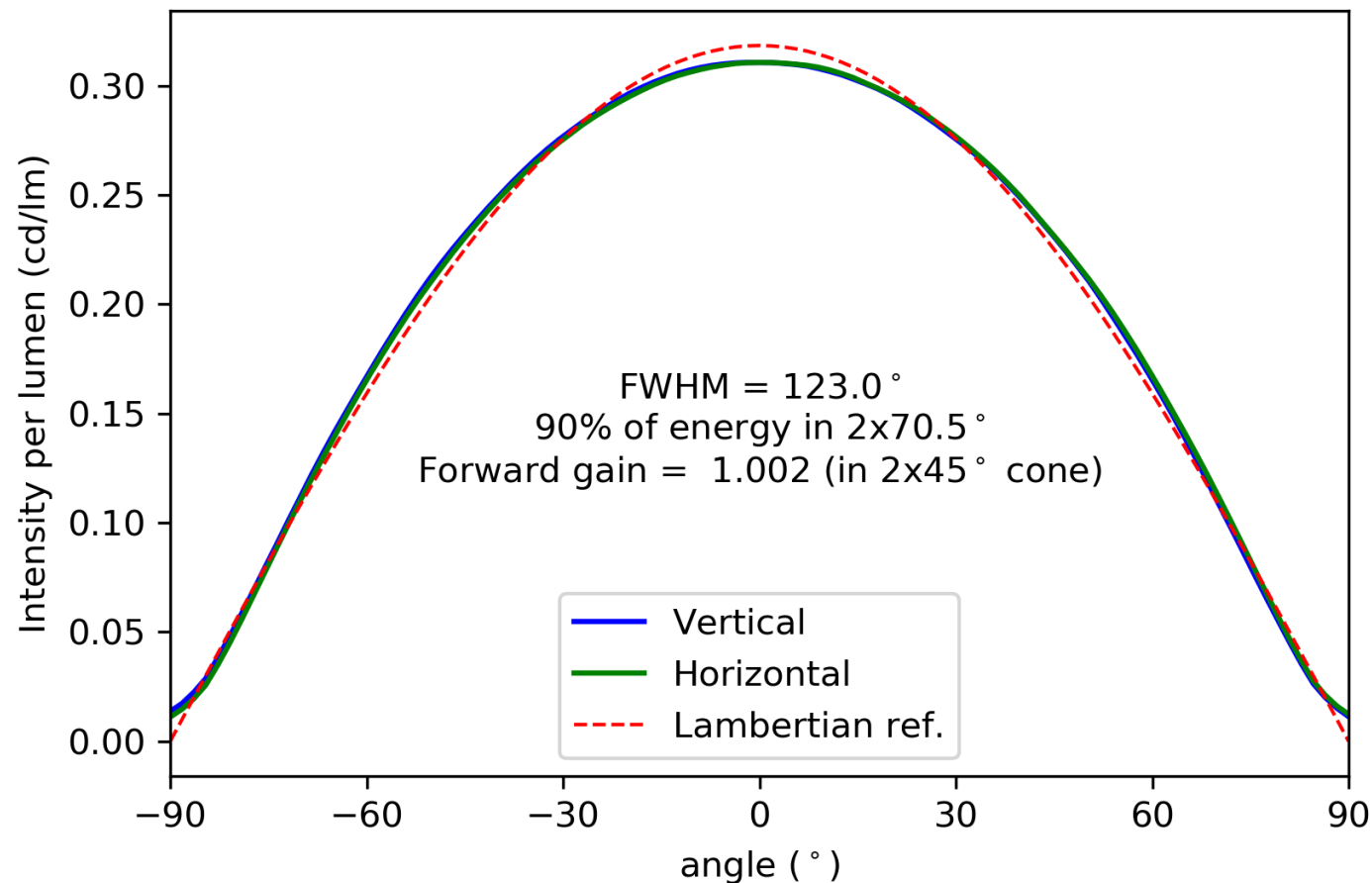


Source luminance (FWHM) = 1.06 x 1.06 mm<sup>2</sup>

# LUXEON FX Plus CW - PCN # 2018044

## 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

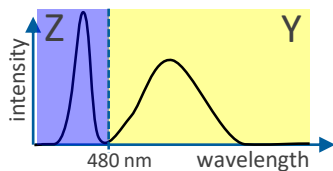
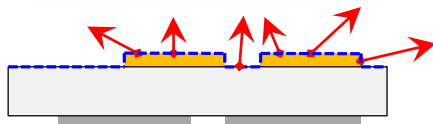
**Spectral Information**

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

**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.

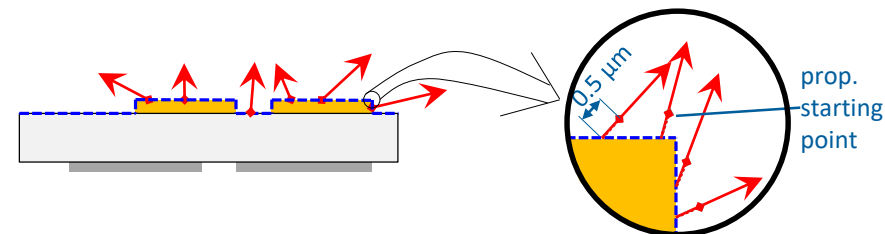
### Projected Raysets: Propagated ray starting points

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  $\mu\text{m}$  → 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.





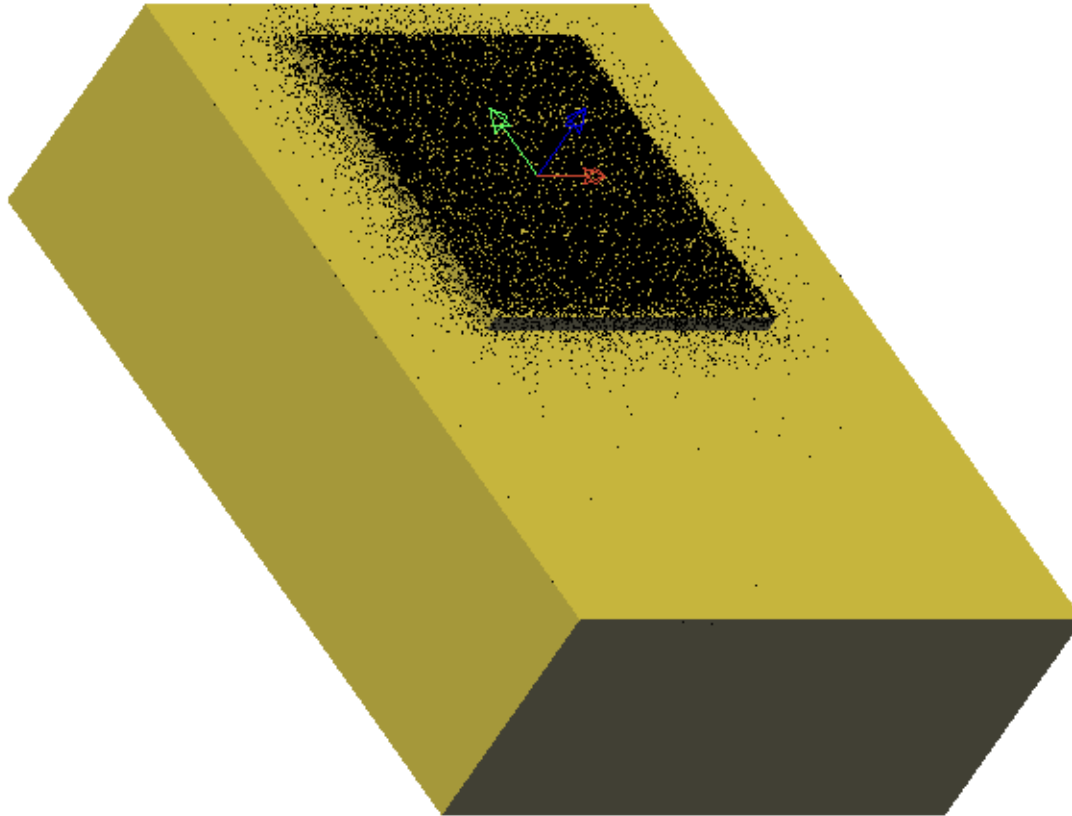
# LUXEON FX Plus CW - PCN # 2018044

## Rayset Download Links

Prosource		LUXEON_FX_PlusCW_20190507_1096.rs8 Download link: <a href="https://www.sendspace.com/pro/dl/zefbtc">https://www.sendspace.com/pro/dl/zefbtc</a>	179 MB	
LightTools	Spectral Projected:	LUXEON_FX_PlusCW_20190507_40M_proj_spectral_LT.ray Download link: <a href="https://www.sendspace.com/pro/dl/6nl464">https://www.sendspace.com/pro/dl/6nl464</a>	1.19 GB	40M
	Y-Component Projected:	LUXEON_FX_PlusCW_20190507_20M_proj_Y_LT.ray Download link: <a href="https://www.sendspace.com/pro/dl/7w1ti8">https://www.sendspace.com/pro/dl/7w1ti8</a>	533 MB	20M
	Z-Component Projected:	LUXEON_FX_PlusCW_20190507_20M_proj_Z_LT.ray Download link: <a href="https://www.sendspace.com/pro/dl/lx0d90">https://www.sendspace.com/pro/dl/lx0d90</a>	532 MB	20M
ASAP/LucidShape	Y-Component Projected:	LUXEON_FX_PlusCW_20190507_20M_proj_Y_ASAP.dis Download link: <a href="https://www.sendspace.com/pro/dl/shrdvf">https://www.sendspace.com/pro/dl/shrdvf</a>	533 MB	20M
	Z-Component Projected:	LUXEON_FX_PlusCW_20190507_20M_proj_Z_ASAP.dis Download link: <a href="https://www.sendspace.com/pro/dl/lw5i9y">https://www.sendspace.com/pro/dl/lw5i9y</a>	532 MB	20M
OPTIS SPEOS	Y-Component Spectral Projected:	LUXEON_FX_PlusCW_20190507_20M_proj_Y_spectral_Speos.ray Download link: <a href="https://www.sendspace.com/pro/dl/cbwvwm">https://www.sendspace.com/pro/dl/cbwvwm</a>	609 MB	20M
	Z-Component Spectral Projected:	LUXEON_FX_PlusCW_20190507_20M_proj_Z_spectral_Speos.ray Download link: <a href="https://www.sendspace.com/pro/dl/sn738p">https://www.sendspace.com/pro/dl/sn738p</a>	608 MB	20M
Zemax	Spectral Projected:	LUXEON_FX_PlusCW_20190507_40M_proj_spectral_zemax.dat Download link: <a href="https://www.sendspace.com/pro/dl/eu4jpg">https://www.sendspace.com/pro/dl/eu4jpg</a>	1.19 GB	40M
Far Field	ies:	LUXEON_FX_PlusCW_20190507_40M.ies Download link: <a href="https://www.sendspace.com/pro/dl/avkwaf">https://www.sendspace.com/pro/dl/avkwaf</a>	618 kB	
Spectrum		LUXEON_FX_PlusCW_20190507_spectrum.txt Download link: <a href="https://www.sendspace.com/pro/dl/asyc01">https://www.sendspace.com/pro/dl/asyc01</a>	6.48 kB	
CAD	STEP:	LUXEON_FX_PlusCW_20190507_geometry.STEP Download link: <a href="https://www.sendspace.com/pro/dl/xpfbfp">https://www.sendspace.com/pro/dl/xpfbfp</a>	85.0 kB	
	IGES:	LUXEON_FX_PlusCW_20190507_geometry.IGS Download link: <a href="https://www.sendspace.com/pro/dl/o3aq2h">https://www.sendspace.com/pro/dl/o3aq2h</a>	191 kB	

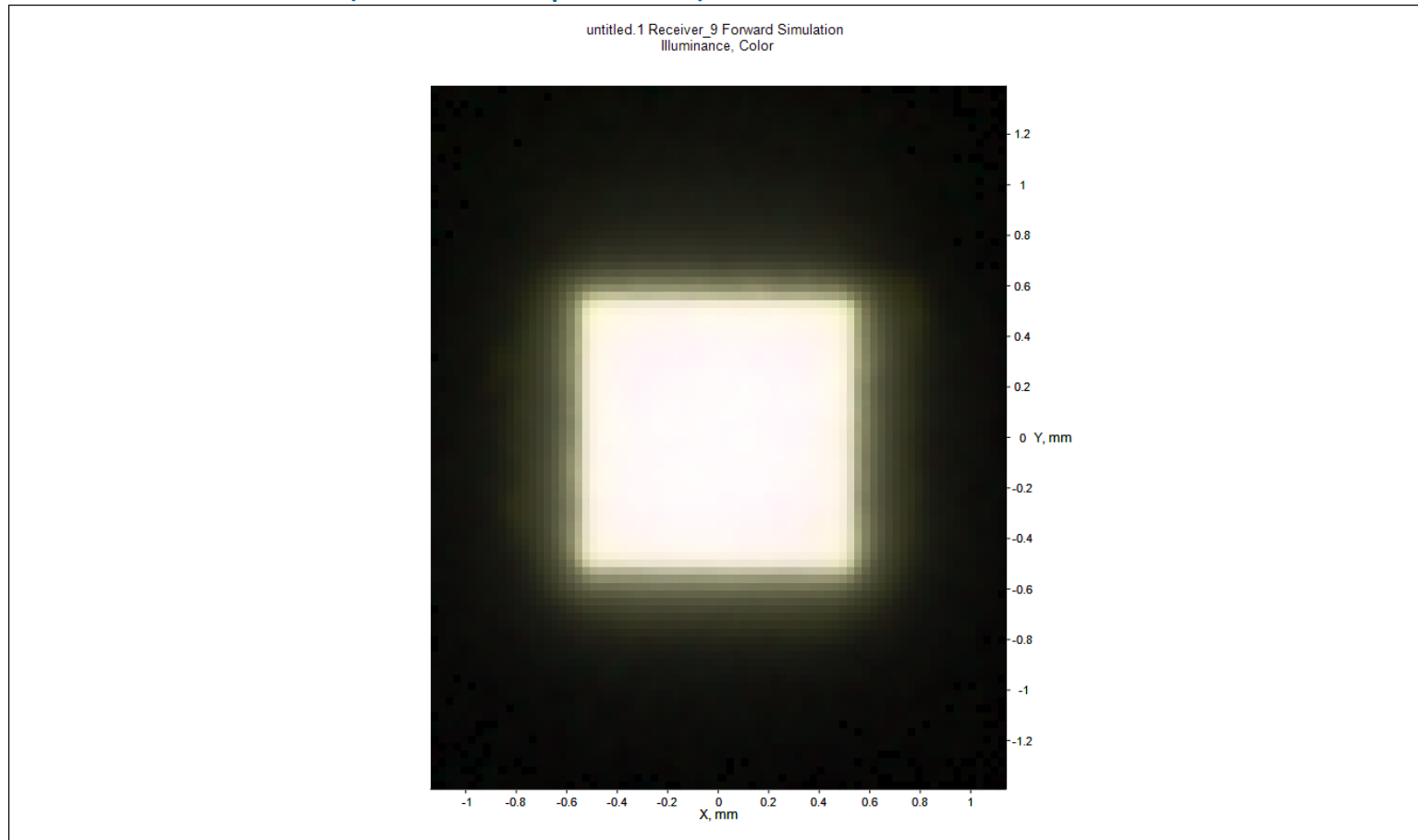
# LUXEON FX Plus CW - PCN # 2018044

3D CAD view + ray starting points



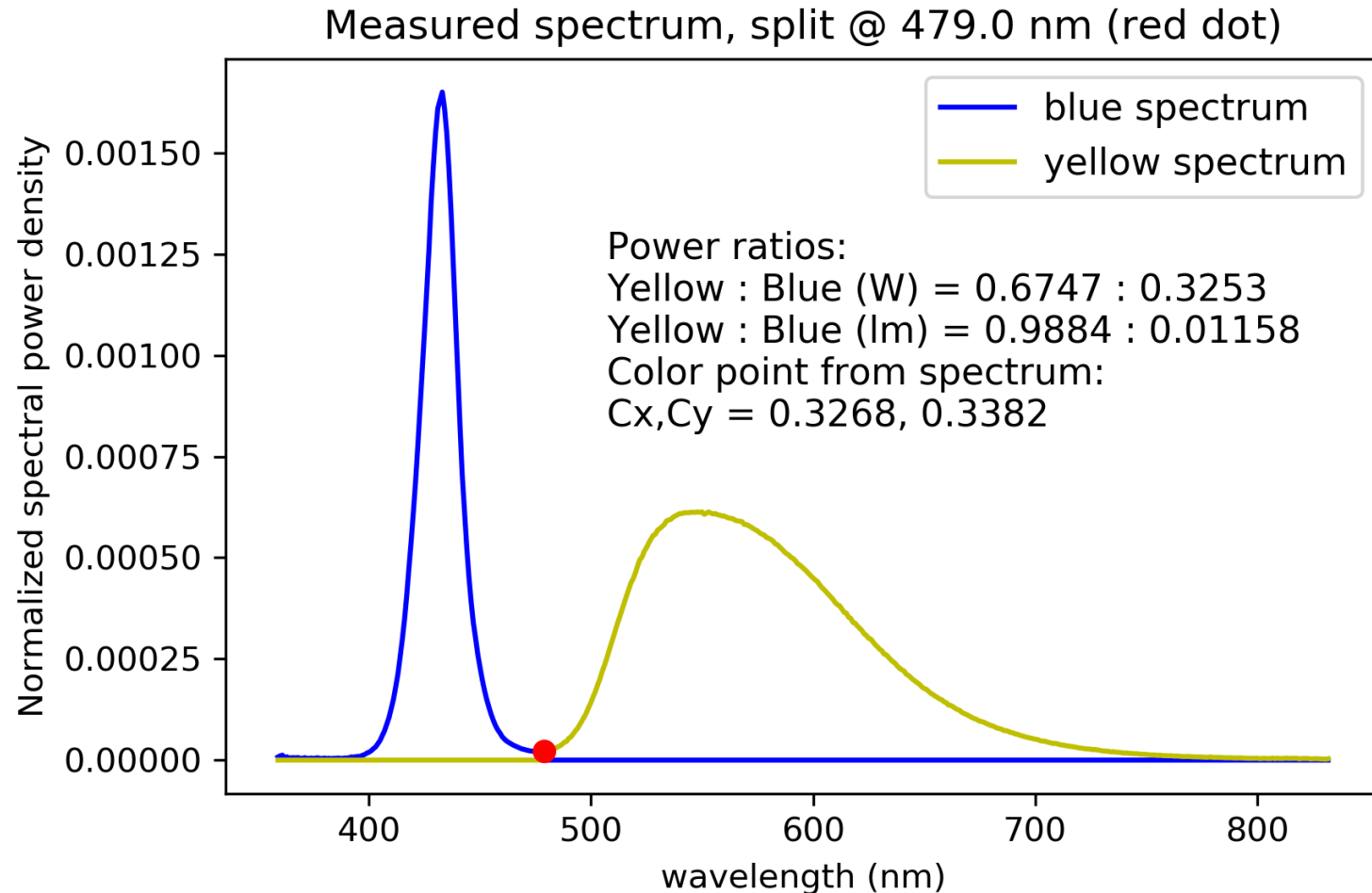
# LUXEON FX Plus CW - PCN # 2018044

## Illuminance color chart (color over position)



# LUXEON FX Plus CW - PCN # 2018044

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



## LUXEON FX Plus CW - PCN # 2018044

### Color data info

Parameter	Value
yellow : blue ratio (W) (from measured spectrum)	0.6747 : 0.3253
yellow : blue ratio (lm) (from measured spectrum)	0.9884 : 0.01158
Average color point Cx, Cy (from measured spectrum)	0.3268, 0.3382
Average color point Cx, Cy (from simulation)	0.3267, 0.3403
Color point Cx, Cy @ HV (from simulation)	0.3257, 0.3367
Average CCT (K) (from simulation)	5.758e+03

Lumileds ref.: 1096\_LUXEON FX Plus CW - PCN # 2018044\_20190507



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