



#### LED LUMINAIRE ANALYSIS: START-TO-FINISH

A Back-to-Basics TracePro Webinar July 30, 2014



#### Presenter

#### Presenter

Dave Jacobsen Sr. Application Engineer Lambda Research Corporation

#### Moderator

Mike Gauvin Vice President of Sales and Marketing Lambda Research Corporation



#### Format

- A 25-30 minute presentation followed by a question and answer session
- Please submit your questions anytime using Question box in the GoToWebinar control panel





## **Additional Resources**

Past TracePro Webinars

http://www.lambdares.com/webinars

- TracePro Tutorial Videos http://www.lambdares.com/videos
- TracePro Tutorials

http://www.lambdares.com/features/tracepro-tutorials

Information on upcoming TracePro Training Classes
<u>http://www.lambdares.com/training/software-training</u>



## **Upcoming TracePro Training**

- KU Leuven Ghent, Belgium
  - Introduction to TracePro Sept. 16 -17, 2014
  - Optimization with TracePro– Sept. 18, 2014
- Littleton, MA USA
  - Introduction to TracePro Oct. 6 Oct. 7, 2014
  - Optimization with TracePro Oct. 8, 2014
  - Stray Light Analysis Using TracePro Oct. 9, 2014
  - Scheme Macro Programming Oct. 10, 2014



## **LED Professional Symposium and Expo**

#### • Bregenz, Austria

 LED Luminaire Design Optimization - Theory, Methods, and Applications Workshop – October 2, 2014







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## Agenda

- Import a luminaire model from a CAD program into TracePro
- Use the TracePro Bridge for SolidWorks to simplify the workflow
- Apply Surface and Material Properties
- Set up the LED sources using the Surface Source Property
- Run the raytrace
- Analyze the results including irradiance maps, candela plots, and IES and LDT file
- Questions and Answers



# The Goal – Analyze a LED Luminaire Imported from a CAD Program





### **LED Luminaire Analysis Process – Typical Workflow**



#### **LED Luminaire Analysis Process – Typical Workflow**



#### **CAD Model**





#### **CAD Model Imported into TracePro**





### **Model Properties**





#### **Model Properties**





#### **Model Properties**







## **Live Demonstration**



#### **Review of Results**





## **Voxel Settings and Raytrace Times**

- 2 million rays traced
  - Uniform Voxels 31 minutes
  - Octree Voxels 6 minutes
- 4 million rays traced
  - Uniform Voxels 60 minutes
  - Octree Voxels 12 minutes

If there is "empty" space in the model, using the Octree voxel setting can decrease raytrace time

options   Thresholds   Sim	ulation & Output	Advanced
Voxelization Type		
Type of Voxels:	Octree	-
	Uniform	
- Voxel Parameters	Octree	
Optimal Ed Optimal Fa	ges in Voxel: 0 ces in Voxel: 5	
Gradient index sub	ostep tolerance $1.0$	De-06 mm 💌



#### **Voxel Settings and Raytrace Times**



#### **Review of Results – Illuminance Map**





## **Review of Results – Illuminance Map TrueColor**

		)
Irradiance/Illuminance Map:[Desk Lamp Assembly, Finished Model.oml]		
Total - True Color Map for Absorbed Flux		
Targeen/Doss=Extrader Top	( 267 167 701)	
(333,-167,-791)	(-367,-167,-731)	
		22
(333,-167,-90.6) millimeters	(-367,-167,-90.6)	
True Color Total Flux:253 79 Im 3590922 Incident Reve		



#### **Review of Results – 3D Illuminance Map**





#### **Review of Results – 3D Illuminance Map TrueColor**





#### **Review of Results – Photorealistic Rendering**





#### **Review of Results – Illuminance Map CIE XY and CCT**





#### **Review of Results – Illuminance Map CIE U'V' and CCT**





#### **Review of Results – Polar Candela Distribution**



#### **Review of Results – Rectangular Candela Distribution**





#### **Review of Results – Polar Iso-Candela**





#### **Review of Results – Rectangular Iso-Candela**





#### **Review of Results – Saving IES File**



## **Review of Results – IES/LDT Analysis Utility**

File Analysis Font Help	TracePro
Plot Type: 3D Polar Distribution 👻	
	Options
	No options available.
w (	
A	
	-IES/LDT Source Information
	IESNA1M-63-2002
	TESTIGenerated by TracePro Release: 7 4 3
	[MORE]C:\Users\djacobsen\Documents
$\wedge k \times \lambda$	WebinarsUuly 2014, LED Luminaire Analysis
1 tas	VDesk Lamp Assembly, Finished Model.oml
	TILI =NONE
	Data Type: Type C
Alter 1 and	Number of Lamps: 1
	Rated Lumens/Lamp: 361.588538
,	Multiplying Factor : 1
	Output Lumence 253.05
	K value: 0.720
	Efficiency 70.0%



#### **Review of Results – Custom Lighting Report**





TracePro streamlines the luminaire analysis process and accelerates product time to market with:

 $\checkmark$  The ability to import models in multiple CAD formats as well as the

TracePro Bridge for SolidWorks

- $\checkmark$  Superior raytracing performance
- $\checkmark$  Tools and utilities optimized for the lighting and luminaire designer
- $\checkmark$  Powerful 2D and 3D optimization capabilities
- $\checkmark$  Comprehensive visualization and analysis tools

For more information or to sign up for our free 30-day trial please visit us at:

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