LED LUMINAIRE ANALYSIS: START-TO-FINISH

A Back-to-Basics TracePro Webinar

July 30, 2014
Presenter

• Presenter
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• Moderator
  Mike Gauvin
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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
  http://www.lambdares.com/training/software-training
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
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

1. Design Luminaire in CAD Program
2. Import Luminaire Model into TracePro (SAT, STP, IGS, OML, etc…)
3. Apply Material and Surface Properties
4. Set-Up LED Sources (Surface Source Property or Rayfile)
5. Raytrace
6. Analyze Results
7. Export IES and/or LDT Files
8. Generate Lighting Report
LED Luminaire Analysis Process – Typical Workflow
CAD Model
CAD Model Imported into TracePro
Model Properties

- Perfect Absorber
- Black Paint
Model Properties

- Cree XP-E
- 2600-3700K x4
- Mirror
LED Luminaire Analysis

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.
Voxel Settings and Raytrace Times

Uniform Voxels

Octree Voxels
Review of Results – Illuminance Map
Review of Results – Illuminance Map TrueColor
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

Polar Iso-Candela Plot
Using incident rays on Target-1/Boss-Extrude1 Top

Min: 8.4218e-016 cd, Max: 260.6 cd, Total Flux: 253.79 lm
3590922 Rays
Data covers +/- 90,000 degrees from Normal
Review of Results – Rectangular Iso-Candela

Rectangular Iso-Candela Plot
Using incident rays on Target-1/Boss-Extrude1 Top

Min: 1.0454e-015 cd, Max: 260.39 cd, Total Flux: 253.79 lm 3590922 Rays
Review of Results – Saving IES File
Review of Results – IES/LDT Analysis Utility

IES/LDT Analysis Utility

Plot Type: 3D Polar Distribution

Options
No options available.

IES/LDT Source Information

IESNA:LM-63-2002
[Test]Generated by TracePro Release: 7 4 3
[more]c:\users\djacobson\documents\webinars\july 2014, led luminaire analysis\desk lamp assembly, finished model.oml
[tilt]=none

data type: type c
number of lamps: 1
rated lumens/lamp: 361.588538
multiplying factor: 1

output lumens: 253.05
k value: 0.720

Efficiency: 70.0%
Review of Results – Custom Lighting Report

Webinar Desklamp Custom Lighting Report

[Images of lighting data and graphs]
TracePro streamlines the luminaire analysis process and accelerates product time to market with:

- The ability to import models in multiple CAD formats as well as the TracePro Bridge for SolidWorks
- Superior raytracing performance
- Tools and utilities optimized for the lighting and luminaire designer
- Powerful 2D and 3D optimization capabilities
- Comprehensive visualization and analysis tools

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

www.lambdares.com

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