

# **New Features in TracePro**

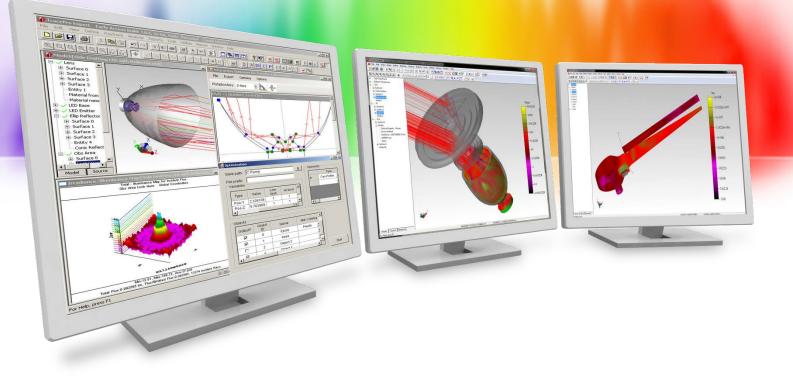


# New TracePro Release Numbering

- TracePro has switched to a yearly naming scheme. TracePro 2020 version 20.1 was the first release of TracePro in 2020.
- Official releases of TracePro 2020 will debut approximately every 60 days on or around the 10<sup>th</sup> of the month, starting in February.







# New Features in TracePro 2020 20.4

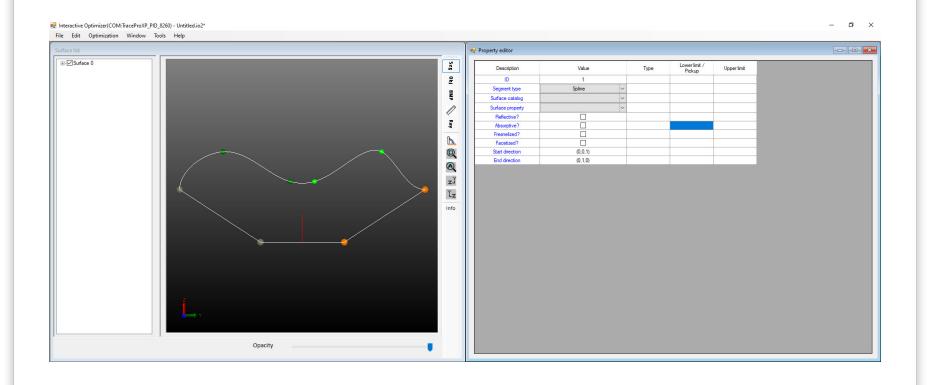


#### Interactive Optimizer

Two new properties for the Spline segment: Start direction and End direction

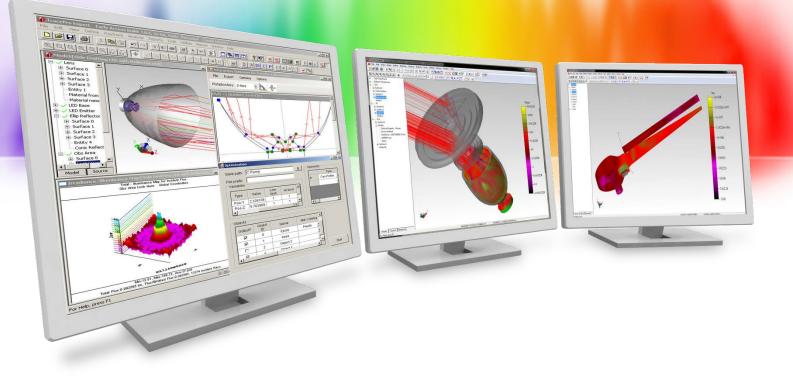


Interactive Optimizer – New Start and End directions can be used to control the terminal slope of a generated spline curve









# New Features in TracePro 2020 20.3



#### TracePro

- New arguments for geometry:baffle-vane Scheme command
- New Scheme command modify:baffle-vane



#### TracePro

New arguments for the geometry:baffle-vane Scheme command have been added. The user can now enter values for the angles in degrees and apply a name to the baffle.

Action:	Creates a TracePro <mark>baffle</mark> vane.
Syntax:	( <b>geometry:<mark>baffle</mark>-vane</b> app-radius tube-radius [conical-angle=45] [grnd-angle=30] [thickness=0.1] [knife-radius=0.01] [center=(0,0,0)] [rot-x=0] [rot-y=0] [rot-z=0] [degrees=#f] [name=""])
Arg Types:	app_radius real tube_radius real conical_angle real grnd_angle real thickness real knife_radius real center position rot_x real rot_y real rot_z real degrees boolean name string
Returns:	entity
Errors:	None
Description:	The <b>baffle</b> vane is created based on the definitions in TracePro. The app_radius (Aperture Radius) and tube_radius (Tube Radius) are required. The conical-angle default to 45 degrees and the relative Ground Angle (grnd-angle) defaults to 30 degrees. The thickness default in .1 mm and the knife-radius has a default of .01 mm. The <b>baffle</b> vane will be placed at the global origin without any rotation.
	Note that all the angles must be entered in Radians unless degrees is set to true.
Limitations: Example:	Not applicable



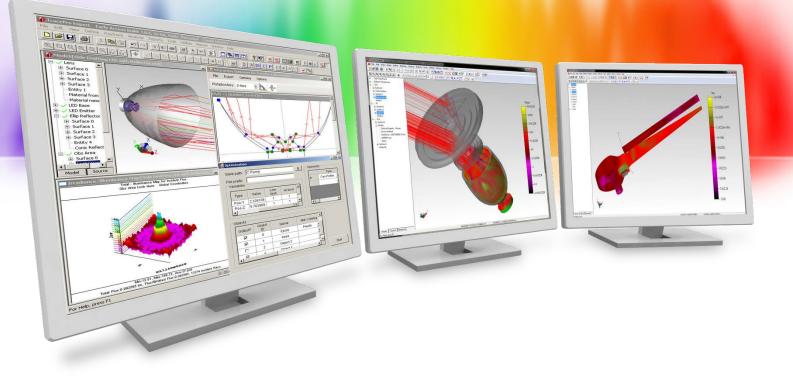
#### TracePro

A new Scheme command modify:baffle-vane has been added

Action:	Modifies a TracePro <mark>baffle</mark> vane.
Syntax:	( <b>modify:<mark>baffle</mark>-vane</b> body app-radius [tube-radius] [conical-angle] [grnd-angle] [thickness] [knife-radius] [center] [rot-x] [rot-y] [rot-z] [degrees=#f] [name])
Arg Types:	body entity app_radius real tube_radius real conical_angle real grnd_angle real thickness real knife_radius real center position rot_x real rot_y real rot_z real degrees boolean name string
Returns:	entity
Errors:	None
Description:	The arguments are based on the <b>baffle</b> vane parameters in TracePro. The parameters default to the current values for the body. Only the app_radius (Aperture Radius) is required. All properties will be preserved provided that the modified body has the same number of faces as the original.
	Note that all the angles must be entered in Radians unless degrees is set to true.
Limitations: Example:	Not applicable







# New Features in TracePro 2020 20.2



#### TracePro

New Material Property catalog for Dow Silastic moldable silicone materials

#### Texture Optimizer II

- New capability for a random dot distribution
- New capability for smoothing the dot distribution
- New tool to measure Dot spacing

#### Interactive Optimizer

- Added ability for viewing the TracePro model in the Interactive Optimizer
- New capability to locate the position, normal, and uv coordinates of an existing model
- New simplified capability the marked trajectory information above in an After-scheme macro

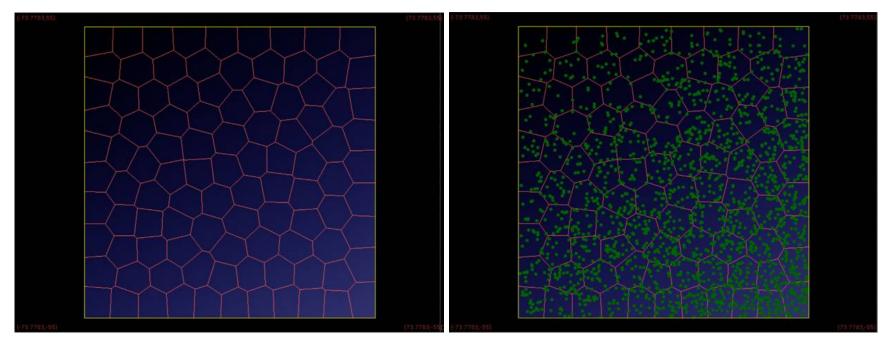


TracePro – A new catalog of Dow Silastic moldable silicone has been added. User's can updated their catalogs in TracePro by going to: Help->Update Property Data

Material Property	y Editor				
221	1 🗆 🖃 🐨 🕋				
Catalog	Catalog: Dow	-	Name: No	ne>	•
Add Catalog	Description:			ne> STIC MS-1002	
Delete Catalog	Interpolation: Table		SILA	STIC MS-1002 STIC MS-1003 STIC MS-4002	
Add Property	Min Wavelength: 0		SILA	STIC MS-4007	
Delete Property			Max WalSILA	STIC MS-4022	
Copy Property					
Data Points					
Sort by					
<u>A</u> dd	]				
Delete,					



Texture Optimizer II – Two methods of adding a random dot pattern have been added: using cell densities and using a density map

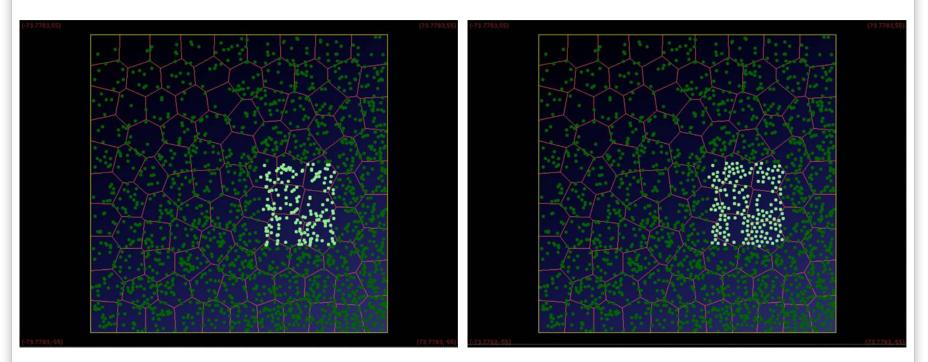


Varying density map

Random dots using density map



Texture Optimizer II – The distribution of the dots can be smoothed using the Molecular Dynamics Simulation approach

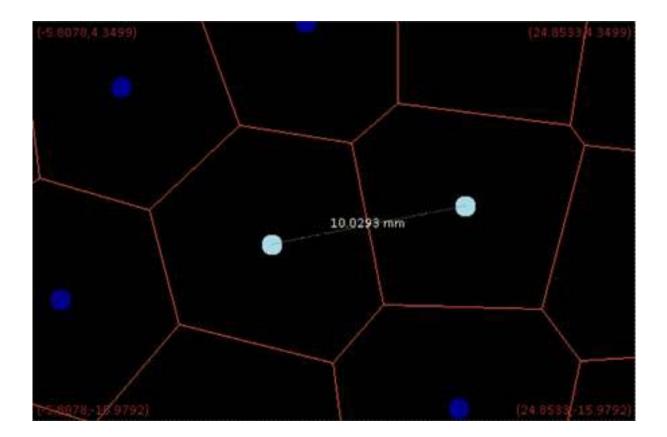


A group of dots selected for smoothing, some dots are overlapping

The smoothing function adjusts the dot positions so they are no longer overlapping

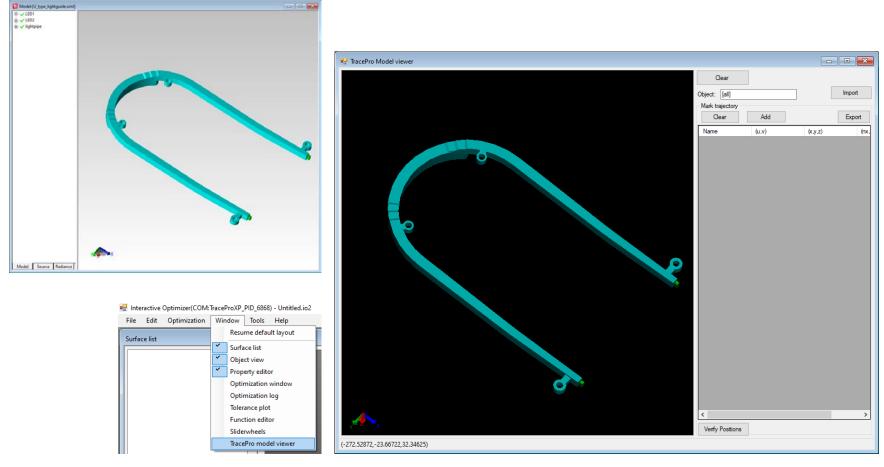


Texture Optimizer II – The distance between two dots selected for smoothing can be displayed





Interactive Optimizer – The current TracePro model can now be viewed in the optimizer. Either all objects or selected objects can be viewed.



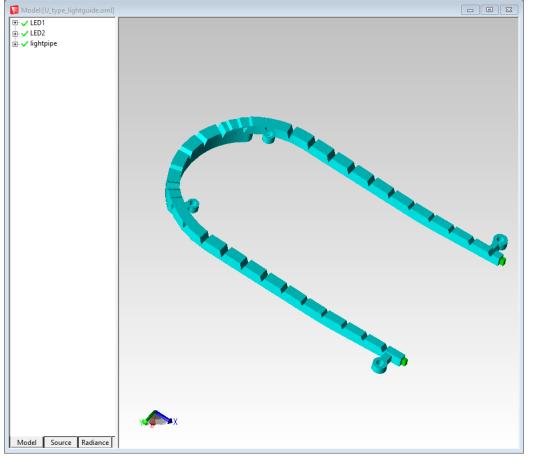


Interactive Optimizer – The trajectory of a path along a surface of the model from TracePro can be easily plotted

	Clear			
	Object: [all]			Import
	Mark trajectory			
	Clear	Add		Ехро
	Name	(u,v)	(x.y.z)	(nx,ny,nz)
¥	lightpipe/Surface	(0.0341,1.0622)	(-278.48538,21.1	(-0.07974,0.0,-0
	lightpipe/Surface	(0.6398,1.0622)	(-293.82059,21.1	(-0.07974,0.0,-0
	lightpipe/Surface	(-0.8289,-1.058)	(-309.67563,21.0	(0.0,0.0,-1.0)
σ	lightpipe/Surface	(-0.834,-0.5106)	(-323.58127,21.1	(0.0,0.0,-1.0)
	lightpipe/Surface	(-0.834,-0.0552)	(-335.14764,21.1	(0.0,0.0,-1.0)
•	lightpipe/Surface	(-0.7879,0.2774)	(-343.595,20.013	(0.0,0.0,-1.0)
	lightpipe/Surface	(-0.6651,0.5178)	(-349.70309,16.8	(0.0,0.0,-1.0)
•	lightpipe/Surface	(-0.5117,0.6662)	(-353.47192,12.9	(0.0,0.0,-1.0)
	lightpipe/Surface	(-0.2712,0.789)	(-356.59094,6.88	(0.0,0.0,-1.0)
<u>•</u>	lightpipe/Surface	(0.0307,0.8299)	(-357.63062,-0.7	(0.0,0.0,-1.0)
	lightpipe/Surface	(0.3019,0.7788)	(-356.33102,-7.6	(0.0,0.0,-1.0)
0 🥒	lightpipe/Surface	(0.5424,0.6406)	(-352.82211,-13	(0.0,0.0,-1.0)
9	lightpipe/Surface	(0.6907,0.4769)	(-348.66342,-17	(0.0,0.0,-1.0)
	lightpipe/Surface	(0.8135,0.2057)	(-341.77557,-20	(0.0,0.0,-1.0)
<b>Ö</b>	lightpipe/Surface	(0.8391,-0.3929)	(-326.57034,-21	(0.0,0.0,-1.0)
	lightpipe/Surface	(0.8391,-0.9813)	(-311.625,-21.31	(0.0,0.0,-1.0)
	lightpipe/Surface	(0.8759,-1.0673)	(-299.79871,-21	(-0.07974,0.0,-0
	lightpipe/Surface	(0.029,-1.0673)	(-278.35544,-21	(-0.07974,0.0,-0
	Verify Positions			
7756,-29.37081,30.62964)	temp temption			

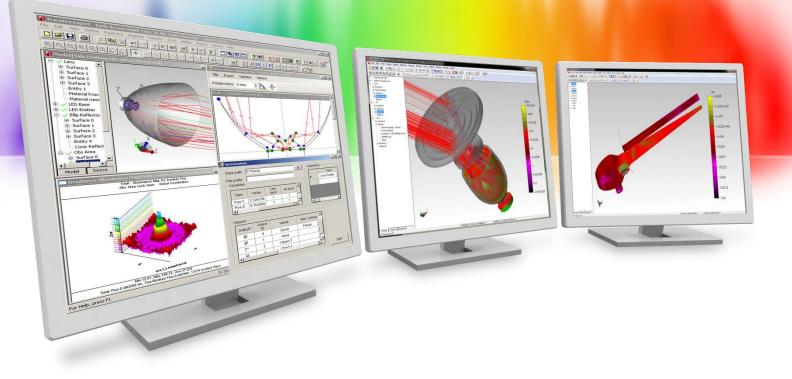


Interactive Optimizer – The trajectory of a path can be exported and used in an After-scheme macro to add periodic structures to a light guide surface









# New Features in TracePro 2020 20.1



#### TracePro

Enhanced Thin Sheet capabilities including new shape options and the ability to modify existing Thin Sheet primitives

#### Surface Property Generator

Added capability to import scatter data files from Surface Optics Corp.

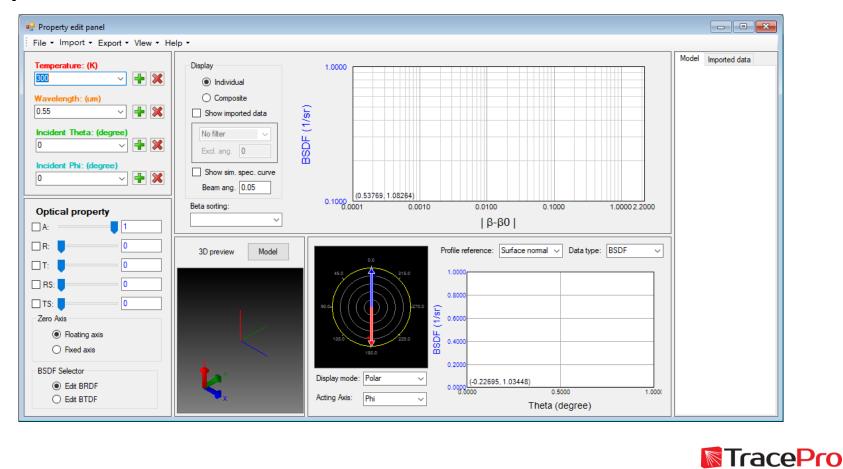
#### New Scheme Commands



TracePro – The Thin Sheet Primitive Solid now has new options for shapes including: ellipse, circle, rectangle, regular polygon, and irregular polygon. Existing Thin Sheet primitives can now be modified after they are created.

Thin Sheet 1  Insert Primitive Solids — X Block Cylinder/Cone Torus Sphere Thin Sheet	
Biok Cyinder/Cone Torus Sphere Thin Sheet Name: Thin Sheet 1 Shape: Ellipse Semi-Di Circle Rectangle Regular Polygon Center Position X: 0 Y: 0 Z: 0 In Degrees Insert Modify Y	
odel Source Radiance	

Surface Property Generator – BRDF files from Surface Optics Corporation can now be loaded in the Surface Property Generator to make new Surface Properties for use in TracePro



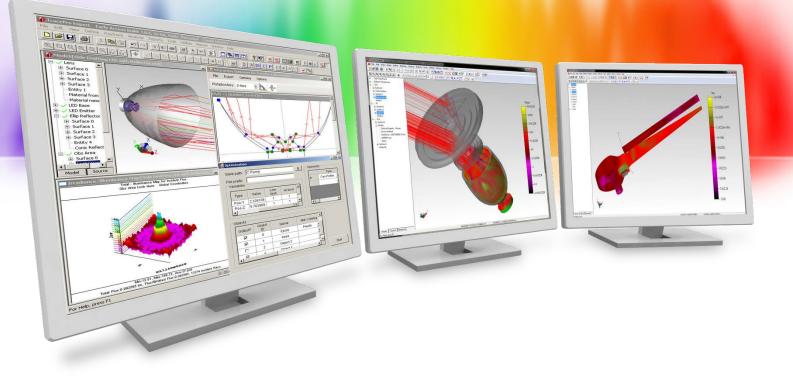
#### Scheme – New Scheme commands have been added

Ten new Scheme commands are now available:

- (geometry:thin-sheet)
- (geometry:thin-sheet-circle)
- (geometry:thin-sheet-ellipse)
- (geometry:thin-sheet-rectangle)
- (geometry:thin-sheet-regular-polygon)
- (modify:thin-sheet)
- (modify:thin-sheet-circle)
- (modify:thin-sheet-ellipse)
- (modify:thin-sheet-rectangle)
- (modify:thin-sheet-regular-polygon)







# New Features in TracePro 2019 19.6



#### Interactive Optimizer (TracePro Standard and Expert)

- XY Polynomial surface extended to 20<sup>th</sup> order
- New option to set the size of the saved Irradiance Maps and Candela Plots during the optimization

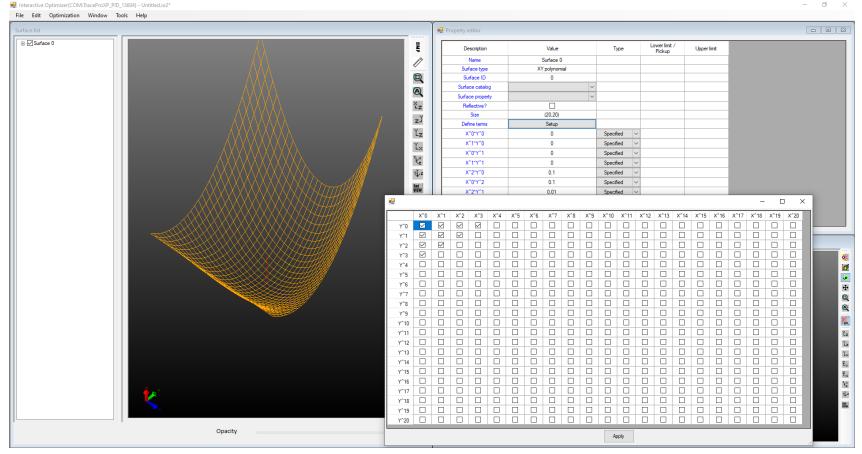
#### > Texture Optimizer II (TracePro Expert)

Dot coefficients can be modified by interactively dragging a spline curve in the dot list editor

#### New Scheme Commands



# Interactive Optimizer – The XY Polynomial surface can now be defined to the 20<sup>th</sup> order





Interactive Optimizer – The window size of the Irradiance Maps and Candela Plots saved during the optimization can now be set by the user

Options								Х
Surface editor	Object editor	Ray editor	Tolerance	plot	General			
☑ Save o	ptimization resul	t bitmaps	BMP		$\sim$			
🗹 Save Ir	nteractive Optim	izer during o	ptimization					
Temp.fold	er: C:\Users\d	jacobsen V	ppData\Lo	cal\T	emp\LAM_IO2	2	Browse	
Saved irrad	iance window si	ze: 500		х	500			
Saved can	dela window size	: 500		x	500			
						OK	Cancel	



Texture Optimizer II (COM:TraceProXP\_PID\_13604)

Texture Optimizer II – Dot coefficients, such as radius or position, can now be modified by interactively by dragging a spline curve in the dot list editor

System Tools Help				
🖳 Dot generator				
File Import Export Action				
Boundary	Partition	In-cell	Dot shape	
Rectangle ~ Apply	Grid ~ Generate	One-Centroid ~ Generate	Sphere ~	
Width: 100 Height: 100	X-Num: 30 Y-Num: 30		Bump sign: Bump  V Dot preview	
Layer ID: 0			Param Value	
			radius 0.1	
			height 0.1	
Dot viewer		Mode		
1511.2368,11.651,				
		Display Boundary	Scale Export	
		Partition	Cell operations	
		Density map	Tamet cells: All	
		🖳 🖳 Column data edit - Sphere	(col idx:3, value:radius)	
		Dens 52.2518		7
		40.0		_
		30.0		_
		20.0		_
(-10.7368,-14.113)	(15.3256-1			
(*10.7300)*14.313)	(13.5230)-1	s	0	
		-10.0		
Generating 900 dots done (0.0 sec)		-20.0		Bind?
				Modify
		-37.058	200.0 300.0 400.0 500.0 600.0 700.0 800.0	
		0.0 100.0	Dot ID	



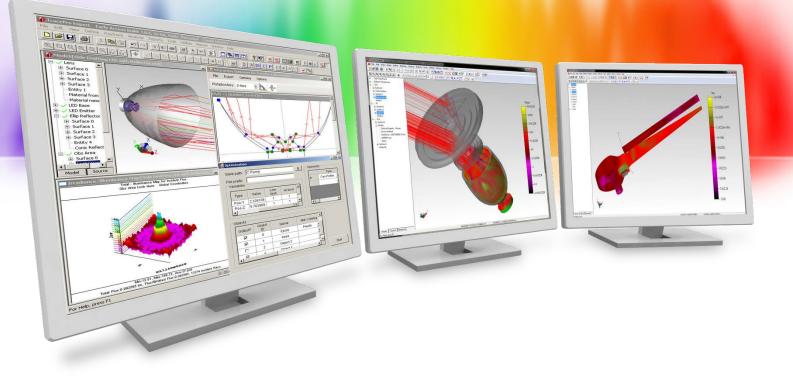
#### Scheme – New Scheme commands have been added

Four new Scheme commands are now available:

- ➤ (edit:get-faces)
- (geometry:create-sheet-from-planar-edges)
- (raytrace:get-surface-source-scale)
- (raytrace:set-surface-source-scale)







# New Features in TracePro 2019 19.4



#### TracePro

- Updated to ACIS 29
- New Flux Report feature added
- Toolbar updates

#### > 3D Interactive Optimizer (TracePro Standard and Expert)

- Renamed Interactive Optimizer
- New RepTile object type added

#### > 3D Geometry Modeler (TracePro LC)

Renamed Geometry Modeler

#### > 2D Interactive Optimizer and 2D Geometry Modeler

Discontinued

#### > Texture Optimizer II (TracePro Expert)

- Texture Optimizer discontinued
- DMD Generator has been merged with the Texture Optimizer II

#### New Scheme Commands

TracePro – The ACIS CAD kernel in TracePro has been updated to ACIS Version 29.0.1

About TracePro Expert	
TracePro® 2019 Expert - 19.4 Release ACIS® Version 29.0.1	Copyright © 1995 - 2019 Lambda Research Corporation Temporary license expires on December 31, 2019.
Total Physical Memory: 32950732	Available Virtual Memory: 137433845712
Available Physical Memory: 24062408	1940344 KB Free on C:
	Spatial Corp. © 1986 - 2019. All Rights Reserved. Copyright Chris Maunder
	1997 - 2002, Makoto Matsumoto and Takuji Nishimura, ights reserved.
	OK



TracePro – The Flux Report has been enhanced with a new feature: you can now limit the Flux Report to include only those objects and surfaces with non-zero-flux.

Flux Report:[L	Flux Report:[LED Downlight, spot.oml]							
Source selection: All Sources								
Wavelength s	election: waveleng	th totals	•	Oisplay All O	Objects			
<ul> <li>Only display</li> </ul>	✓ Only display objects and surfaces with non-zero flux: Incident							
Object Name	Material Catalog	Material Property	S Absorbed	lumber	Incident			
Surface Name	Surface Catalog	Surface Property	Lost [sq mm]	of rays	[lumens]			
LED 1	<none></none>	<none></none>			0.281176942620518			
Emitter	Default	<none></none>	6.25	302	0.158632492844508			
Surface 1	Default	<none></none>	6.25	305	0.161534387708966			
Surface 2	Default	<none></none>	2.5	114	0.071711694241359			
Surface 3	Default	<none></none>	2.5	102	0.0463162611234435			
Surface 4	Default	<none></none>	2.5	103	0.068313482323218			
Surface 5	Default	<none></none>	2.5	98	0.0558455669995417			



TracePro – The toolbars in TracePro have been updated. The Help toolbar was removed as its functionality was redundant. The option for monochrome toolbars has also been removed. Color toolbars is the only choice now. A new feature to specify large or small icons has been added to make the toolbars easier to see with high resolution monitors.

Toolbars		? ×				
ToolBars		Icon Size				
🔽 File	✓ Define	Small				
🔽 Edit	Analysis	C Large				
View	✓ Tools	- ToolTips				
Geometry	Vindow	Show				
		C Hide				
Restore default dock						
OK Cancel						



TraceDro 2010 Expert

#### 3D Interactive Optimizer – The 3D Interactive Optimizer and the 3D Geometry Modeler have been renamed the Interactive Optimizer and Geometry Modeler respectively

and accerto coro exp		
File Edit View G	eometry Define Raytrace O	ptimize Analysis Reports Tools Macros Window Help
🗅 🚅 🔒 🎒 🕷	■■ い ∩ ⊕ ⊕	Interactive 🔄 🚍 🛄 🌾 🏫 🔠 📷 🔯 🖉 🔅 🖶 🖾 🐘 🌇
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Model:[Untitled1	1	
📕		
TracePro 2019 LC		
	eometry Define Raytrace A	nalysis Reports Tools Window Help
🗅 🛩 日 🎒	Lens Element	🗾 📃 📐 🕺 🗮 🗖 🛱 🚍 🖽 🤞 🗱 🔠 🚾 🔯 💀 🖉 🚳 🖾
ର୍ର୍ଦ୍ର୍ର୍	Fresnel Lens	zǐ zǐ t <sub>y</sub> yữ xữ t <sub>y</sub> vĩ thự thể
	Reflector	
Model:[Untitle	Tube	
	Baffle Vane	
	Primitive Solid	
	Insert Part	
	Update from RayViz	Y
	Interactive Modeler	

Interactive Optimizer – A new Object Type called RepTile object has been added. This allows the Interactive Optimizer to make solid objects based on RepTile geometry types.

Object View		
	Add a new object	
	Name:       Object 0         Type:       Reptile object       ✓         Transform       ✓       Tilt then Shift         Location:       (0,0,0)       ✓       Tilt then Shift         Local Tilt center:       (0,0,0)       X angle:       0       deg         Y angle:       0       deg       Z angle:       0       deg	
	Reptile type:        Parameter     Sphere Hip Roof Ellipsoid Log Enhanced Prism Flattened Cone Pointed Cone Torus Polygon Pyramid DMD Block     Apply	
]	Chiseled Log	



Texture Optimizer II – The capability previously found in the DMD Generator has been added to the Texture Optimizer II. The Texture Optimizer has been discontinued.

Dot generator		
File Import Export Action		
Boundary Partition	In-cell	Dot shape
Rectangle V Apply Uniform V	Generate One-Centroid ~ Generate	
Width: 100 Height: 100 Cells: 100		Bump sign: Bump V Dot preview
Layer ID: 0	🔛 DMD Texture Generator	- 🗆 X
	File Path: C:\DaveJ\DaveJ pictures\North Load Bi	tmap
Dot viewer		Width:2448 pixels
(97.09,93)		Height 3264 pixels PixelFormat 24bppRgb
TYYIXYX		
	Barrie Contraction of the Contra	Color and Threshold
	Total Mark Shares	OROG B Mono
$H \square X \square Y$		Off :
	- Caller Strate Call	On :
	- in a second of the second second	
(-97.09,-55)	DMD (mm)	
	Type: (Select DMD Model)	Tilt Setting
enerating partitionDone (0.828 sec)	Pitch Width Mirror Width	"Off" (Deg) -12
	Parts Trider	"Flat" (Deg) 0
	Pixel X Pixel Y	
		"On" (Deg) 12
	DMD Height Thickness	
	Hole Width Post Width	
		Generate

#### Scheme – New Scheme commands have been added

Three new Scheme commands are now available:

- (geometry:baffle-vane...)
- (geometry:rectangular-tube...)
- (geometry:ray-test...)

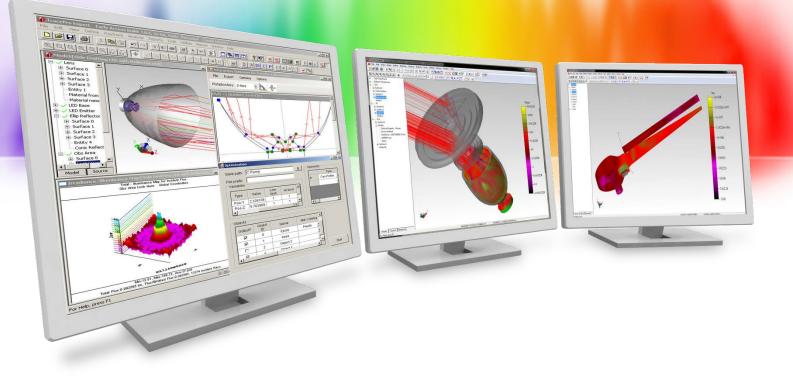
The following Scheme commands have been deprecated:

- (solid:baffle-vane...)
- ➤ (solid:rectangular-tube...)
- (solid:ray-test...)

The Scheme command (edit:surface-revolve...) has been enhanced to optionally calculate the Position on axis of revolution







## New Features in TracePro 2019 19.2



#### ➤ 3D Interactive Optimizer

New shortcuts in the after-scheme editor to run the current macro and to step through the macro line-by-line

#### Texture Optimizer II

New optimizable dot pattern with varying dot pitch

### Analysis Toolkit

Added options for maximum, minimum, and log values for Luminance Analysis

### Lighting Toolkit

- Added SAE J914 regulation
- Capability to set minimum value for the log scale in Contour display mode



**3D Interactive Optimizer – New shortcuts in the after-scheme editor** 

F5 – Executes the current after-scheme macro in TracePro F10 – Enables the step execution mode

F11- Steps forward through the after-scheme macro, executing it line-byline

1	delete("Reflector")	Manua	C			N
2	<pre>copy("Reflector_Original", "Reflector")</pre>	Name	Syntax			ľ
	<pre>(property:set-raytrace-flag (entity:get-by-name "Reflector") #t)</pre>	abs	abs(value)			
4		acos	acos(value)			
	delete("Arc")	acosd	acosd(value)			
	<pre>copy("Arc_Original", "Arc")</pre>	and	and(obj1,obj2)			
8	<pre>(property:set-raytrace-flag (entity:get-by-name "Arc") #t)</pre>	append	append(list, value	)		
-	<pre>grotate("Reflector", pos(-880,475,88), vector(1,0,0), var("XAngle"))</pre>	apply_bulk	apply_bulk(obj,cat,	,prop)		
	<pre>giotate("Reflector", pos(-880,475,88), vector(0,1,0), var("XAngle")) grotate("Reflector", pos(-880,475,88), vector(0,1,0), var("YAngle"))</pre>	apply_material	apply_material(ob	j,cat,mat)		
	<pre>grotate("Reflector", pos(-880,475,88), vector(0,0,1), var("ZAngle"))</pre>	apply_property	apply_property(fac	e,cat,prop)		
2		applybulk	applybulk(obj,cat,p	prop)		
3	<pre>grotate("Arc", pos(-880,475,88), vector(1,0,0), var("XAngle"))</pre>	applymaterial	applymaterial(obj,	cat,mat)		
	<pre>grotate("Arc", pos(-880,475,88), vector(0,1,0), var("YAngle"))</pre>	applyproperty	applyproperty(face	,cat,prop)		
	<pre>grotate("Arc", pos(-880,475,88), vector(0,0,1), var("ZAngle"))</pre>	asc	asc(ch)			
.6		asin	asin(value)			
.7		asind	asind(value)			
.0		atan	atan(value)			
20		atand	atand(value)			
1		average	average(list a,b,c	)		
		avg	avg(list a,b,c)			
		bend	bend(obj,start,end	,init_rail,crv)		
		body_transform	body_transform(ob	j,mx)		
		chr	chr(code)			
		cint	cint(value)			
		close_model	close_model()			
		closemodel	closemodel()			
		copy	copy(obj,nm)			
		cos	cos(rad)			
		<				>
						1
				Discard	Apply	,
				1-01		
				Ln:21	Col:1	1



Texture Optimizer II – New optimizable dot pattern: grid with variable pitch. This type keeps the x or y pitch constant but varies the pitch in the orthogonal direction. The dot size is kept constant.

Import Export Action dary	Partition	Incel	Dot shape
	Grid V Generate	Assigned density-Fix grid V Generate	Sphere V
			Bump sign: Hole V Dot preview
n: 100 Height: 100	X-Num: 15 Y-Num: 1	Pitch x: 1 Pitch y: 30	
r ID: 0 🗸		Density: 0.1	Param Value radius 0.2
ewer			height 0.2
3149,35.3073		52.9759,95.qt73) Mode	neight 0.2
		Display	
		✓ Boundary ✓ Pattion	
		☐ Patton ☐ Densty map	
		☑ Dots	
		Density tools	
		(50.	Scale Export
			Dots operations
			Target dots: All
			Fiter:
			Operation: Select ~
3149,-35.0927)		1¢2.9759,-35.0927)	Apply
g TracePro Texture File with 13193 dots	.Done (0.282 sec)		(50.781843 , -14.297019)

Analysis Toolkit – Options for minimum, maximum, and log values have been added for the Luminance Analysis.

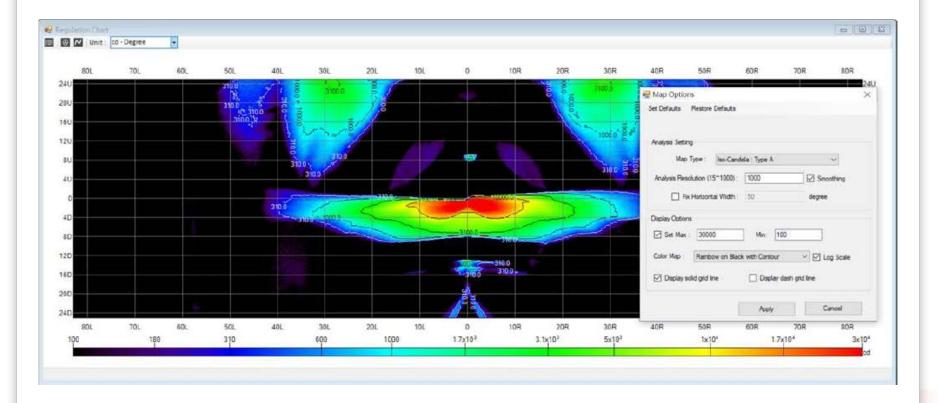
Luminance Analysis - C:\Users\djacobsen\Documents\DaveJ Documents\Tra	ID	New Fea Ave.	tures Pres Max.	entations	s\2019\Lum	inance   SD	Data Type	-		×			
	Phot Set De	torealist faults Set Max Set Min : Log Scal	ic Renderi Restore D : 100000	ng Optio efaults		×	- 21	ty got € ance Data	a.txt A	JI	t∎ i (⊊ i t ⊊ te Analysis	: ?-×	< <u> </u>
											Tra	coD	

Lighting Toolkit – The SAE J914 regulation for side turn signal lamps has been added.

Catal	og : SAE		▼ Regulation :	SAE J914	▼ Tat	ple: SAE J914	2014 Figure 1		▼ Filter	r: Both - Regulation Info.
ID	Show?	Туре	Points or segments	Designation	Max Value	Min Value	Horizontal	Vertical	Unit	
0	$\checkmark$	Point	1	15U-30L	200	0.36	30 L	15 U	cd_HV	
1	$\checkmark$	Point	2	5U-30L	200	0.36	30 L	5 U	cd_HV	
2	$\checkmark$	Point	3	H-30L	200	0.36	30 L	0	cd_HV	
3	$\checkmark$	Point	4	5D-30L	200	0.36	30 L	5 D	cd_HV	
4	$\checkmark$	Point	5	15D-30L	200	0.36	30 L	15 D	cd_HV	
5	$\checkmark$	Point	6	15U-70L	200	0.36	70 L	15 U	cd_HV	
6		Point	7	5U-70L	200	0.36	70 L	5 U	cd_HV	
7	$\checkmark$	Point	8	H-70L	200	0.36	70 L	0	cd_HV	
8		Point	9	5D-70L	200	0.36	70 L	5 D	cd_HV	
9		Point	10	15D-70L	200	0.36	70 L	15 D	cd_HV	
10		Point Col.	Zone I	1+2+3+4+5	-	3	•	•	cd_HV	
11		Point Col.	Zone II	6+7+8+9+10	-	3	•	•	cd_HV	

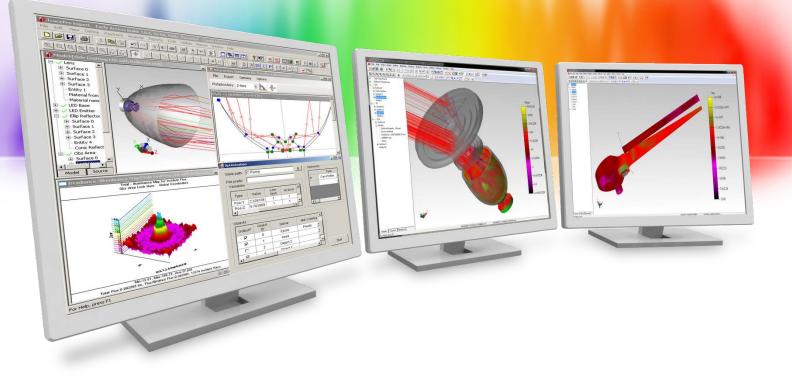


Lighting Toolkit – The ability to select a log scale and a minimum value for the contour display option has been added. Color schemes are also now available with the log scale.









## New Features in TracePro 2019 19.1



#### TracePro

- New intercept type: TIR
- Path Sorting now available for Incident Ray Tables
- New COM method

#### ➤ 3D Interactive Optimizer

- Added ability to use Type D surface to create an extruded object
- New optimization operand: Luminance value from Photorealistic Rendering

### IES/LDT Plot Tool

Now supports tab-delimited IES file

#### > Analysis Toolkit

New ability to show/hide analysis items

#### Surface Property Generator

Added ability to open TracePro Surface Property files

#### New Scheme Commands



# TracePro – A new intercept type, TIR (total internal reflection), is now available for the Incident Ray Table, Ray History Table, and Path Sort Table

arget Recei	ver												Sen	d to Analysis	Toolk
Ray Number	Wavelength	Source	Start Ray	Ray Node	Туре	History	Flux	X Pos.	Y Pos.	Z Pos.	X Vec.	Y Vec.	Z Vec.	OPI.	^
12	0.408453	LED Surface S	12	15	RandTran		6.47611e-05	-0.324003	-38.5	100.871	0.317329	-0.893595	-0.317473	198.946	-15
13	0.408453	LED Surface S	13	13	RandTran		6.49958e-05	0.532137	-38.5	148.512	0.00427558	-0.974501	0.224343	279.854	
14	0.42312	LED Surface S	14	27	RandTran		0.000310705	+1.35641	-38.5	148.87	0.0964375	-0.514124	-0.852277	333.128	
15	0.42312	LED Surface S	15	16	RandTran		0.000380783	0.096311	-38.5	149.541	-0.312877	-0.880744	-0.355526	280.759	
16	0.42312	LED Surface S	16	40	RandTran	TIR	0.000122673	3.82193	+38.5	146.279	0.552175	-0.270557	-0.788608	345.115	
17	0.42312	LED Surface S	17	9	RandTran		0.00038791	-0.533315	+38.5	101.02	-0.103387	-0.994406	-0.0216273	195.068	
18	0.42312	LED Surface S	18	30	RandTran		0.000356695	4.18044	-38.5	152.866	0.719975	-0.163791	0.674395	315.056	
19	0.42312	LED Surface S	19	27	RandTran		0.00020664	1.12349	-38.5	146.105	0.170257	-0.261359	-0.950107	321.357	
20	0.42312	LED Surface S	20	17	RandTran		0.000379217	0.82364	+38.5	150.695	-0.168863	-0.944217	-0.282736	293.061	
21	0.42312	LED Surface S	21	26	RandTran		0.000173638	0.933434	-38.5	154.083	-0.456087	-0.412965	0.782447	300.977	<b>—</b> ],

Wavelength	Ray Node	Start Ray	X Pos.	Y Pos.	Z Pos.	Flux	OPL	X Vec.	V Vec.	Z Vec.	Type	History	Object	Surface
0.408453	1	1	-0.0382504	-0.401894	-1.05	7.44622e-05	0	-0.10979	0.830001	0.54685		Emitted	LED Surface S	Emitter
0.408453	2	1	-0.2207	0.97741	-0.14124	7.44622e-05	1.66181	-0.10979	0.830001	0.54685	SpecTran		LED Body	Surface 12
0.408453	3	1	-0.249056	1,19178	0	7.44622e-05	1.92009	-0.0730061	0.55192	0.830695	SpecTran		Light Guide	Surface 11
0.408453	4	1	-0.752795	5	5.73176	6.87674e-05	12.2965	-0.0730061	-0.55192	0.830695	TIR	TIR	Light Guide	Surface 14
0.408453	5	1	-2.07556	-5	20.7828	6.87674e-05	39.5441	-0.0730061	0.55192	0.830695	TIR	TIR	Light Guide	Surface 12
0.408453	6	1	-2.5	-1.79128	25.6122	6.87674e-05	48.287	0.0730061	0.55192	0.830695	TIR	TIR	Light Guide	Surface 13
0.408453	7	1	-1.60167	5	35.8338	6.87674e-05	66.7916	0.0730061	-0.55192	0.830695	TIR	TIR	Light Guide	Surface 14
0.408453	8	1	-0.278906	-5	50.8848	6.87674e-05	94.0391	0.0730061	0.55192	0.830695	TIR	TIR	Light Guide	Surface 12
0.408453	9	1	1.04386	5	65.9359	6.87674e-05	121.287	0.0730061	-0.55192	0.830695	TIR	TIR	Light Guide	Surface 14
0.408453	10	1	2.5	-6.00829	82.5045	6.87674e-05	151.281	-0.0730061	-0.55192	0.830695	TIR	TIR	Light Guide	Surface 15
0.408453	11	1	2.41333	-6.66352	83.4906	6.87674e-05	153.067	-0.0730061	-0.185862	0.97986	TIR	TIR	Light Guide	Surface 3
0.408453	12	1	1.53716	-8.89409	95.2502	6.87674e-05	171.115	-0.0730061	-0.992059	0.102416	TIR	TIR	Light Guide	Surface 2
0.408453	13	1	0.661	-20.8	96.4793	6.87674e-05	189.163	-0.0730061	-0.874353	0.479767	TIR	TIR	Light Guide	Surface 3
0.408453	14	1	-0.255168	-31.7725	102.5	6.87674e-05	208.035	-0.0730061	-0.874353	-0.479767	TIR	TIR	Light Guide	Surface 0
0.408453	15	1	-0.7334	-37.5	99.3573	6.87674e-05	217.886	0.238934	-0.954241	0.114671	RandTran		Light Guide	Output 1
0.408453	16	1	-0.485605	-38.5	99,4762	5.94e-05	218,923	0	0	0		At Surface	Target	Receiver

	Sources: All	• N	to. of interce	pts:		Filter	Editor	ADD						
	Wavelengths: All	• %0	f rays to disp	skay: 100	S4	elect filters: 🔽 None								
	Source	Wavelength	No. Rays	Absorbed Flux	7 % of Total	Incident Flux	% of Total	Path Type	No. Intercepts	No.	Intercept Type	Object	Surface	T
91	LED Surface Source/Emitter	0.588984432753088		0.138319585595478	0.06	0.138319585595478	0.06	Single Surf Scat						ſ
		-	1.000		1		-	1.1	4	1	Emitted	LED Surface Source	Emitter	1
										2	SpecTran	LED Body	Surface 123_2	1
										3	SpecTran	Light Guide	Surface 11	1
										4	TIR	Light Guide	Surface 12	1
										5	TIR	Light Guide	Surface 15	1
										6	TIR	Light Guide	Surface 14	1
										7	TIR	Light Guide	Surface 13	1
										8	TIR	Light Guide	Surface 2	1
										9	RandTran	Light Guide	Output 1	1
	second of second									10	At Surface	Target	Receiver	1
Ð 2	LED Surface Source/Emitter	0.561066093777315	2	0.117834195661249	0.05	0.117834195661249	0.05	Single Surf Scat	13					1
• 3	LED Surface Source/Emitter	0.561066093777315	2	0.117464876165446	0.05	0.117464876165446	0.05	Single Surf Scat	12					1



TracePro 2019 Expert

# TracePro – Path Sorting can now be used with the Incident Ray Table to show the ray data for each ray in a selected path.

File Edit View Geometry Define Raytrace Optimize Analysis Reports Tools Macros Window Help 🗋 🚔 🔚 🎒 👗 ங 🖀 🖙 ా 🖓 🐠 💓 💽 💽 🔨 👘 🖉 🗮 📰 🖼 🖾 🛸 🖾 🐘 🎆 🌄 🖏 🖏 Model:[Spectrometer.oml] -Path Sort Table (Spectrometer.om) Incident Ray Table: (Spectrometer.om) - 0 % G Spectrometer CCD Detector Detector Send to Analysis Toolkit 🗄 🧹 Slit Sources: All -No. of intercepts: 🛓 🧹 Grating Ray Node Ray Number Wavelength Source Start Ray Type History Wavelengths: All -% of rays to display: 100 Select filte E V Focusing Mirror Slit Grid Source 747 Coinc Surf 0.2 12 SpecTran E Collimating Mirror 0.2 Ray Path Source Slit Grid Source 1027 12 SpecTran Coinc Surf Wavelength No. Rays Absorbed Flux V % of Total Incident Flux CCD Detector 0.2 Slit Grid Source 1254 ① 1 SpecTran Coinc Surf Slit Grid Source 0.4 2497 0.216585503252237 25.21 0.216585503252237 Surface 0 ① 2 Surface 1 Slit Grid Source 0.6 2482 0.215618447884275 25.10 0.215618447884275 0.2 Slit Grid Source 1456 SpecTran Coinc Surf etecto 3 **F** Slit Grid Source 0.2 2498 0.2143507319065 24.95 0.2143507319065 0.2 Slit Grid Source 1559 12 SpecTran Coinc Surf Surface ④ 4 Slit Grid Source 0.8 2442 0.212270378046526 24 71 0.212270378046526 0.2 Slit Grid Source 1602 12 SpecTran Coinc Surf Surface 4 Slit Grid Source 0.4 268 3 24427822679003e-05 0.00 3 24427822670003e-05 0.2 Slit Grid Source 2223 12 SpecTran Coinc Surf Surface 5 ④ 6 Slit Grid Source 0.6 266 3.22513681527293e-05 0.00 3.22513681527293e-05 0.2 Slit Grid Source 2375 12 SpecTran Coinc Surf --- Entity 3 7 Slit Grid Source 0.8 214 2.59623511752743e-05 0.00 2.59623511752743e-05 Block 3 Slit Grid Source 0.2 194 2.3232514265056e-05 0.00 2.3232514265056e-05 Window 🗄 🧹 Detector Mount • 9 Slit Grid Source 0.4 141 1.70693673158651e-05 0.00 1.70693673158651e-05 🗄 🧹 Grating Mount ① 10 Slit Grid Source 0.6 1.63683864006321e-05 135 1.63683864006321e-05 0.00 Collimating Mirror Mount ① 11 Slit Grid Source 0.8 125 1.5164902730942e-05 0.00 1.5164902730942e-05 12 Slit Grid Source 0.2 102 1.22157689255656e-05 0.00 1.22157689255656e-05 🗄 🧹 Case 13 Slit Grid Source 0.6 29 3.69104355163788e-06 0.00 3.69104355163788e-06 🗄 🏑 Cover ① 14 🗄 🧹 Slit Mount Tube Slit Grid Source 0.2 24 3.01381772640017e-06 0.00 3.01381772640017e-06 15 Slit Grid Source 0.8 26 2 9903695375243e-06 0.00 2 9903695375243e-06 16 Slit Grid Source 0.4 2.92341063078904e-06 0.00 23 2.92341063078904e-06 ① 17 Slit Grid Source 0.2 2.58835206917171e-06 0.00 16 2.58835206917171e-06 18 Slit Grid Source 0.8 19 2 41603575837214e-06 0.00 2 41603575837214e-06 ① 19 Slit Grid Source 0.4 15 2.12104581199835e-06 0.00 2.12104581199835e-06 Slit Grid Source 0.2 11 1.97730303855849e-06 0.00 1.97730303855849e-06 ① 21 Slit Grid Source 0.8 15 1.52072323343456e-06 0.00 1.52072323343456e-06 ⊕ 22 3 23 Slit Grid Source 0.6 1.37729544421805e-06 0.00 1.37729544421805e-06 12 3 24 Slit Grid Source 0.6 10 1.35756505121668e-06 0.00 1 35756505121668e-06 ① 25 Slit Grid Source 0.8 9 1.33576687062704e-06 0.00 1.33576687062704e-06 Slit Grid Source 0.8 9 17892437634303e-07 0.00 9 17892437634303e-07 3 27 Slit Grid Source 0.4 8 9.14804045261794e-07 0.00 9.14804045261794e-07 3 28 Slit Grid Source 0.6 8 8.38426978663181e-07 0.00 8.38426978663181e-07 ① 29 Slit Grid Source 0.4 5.08962364827292e-07 0.00 5.08962364827292e-07 30 Slit Grid Source 0.2 3.23089925378786e-07 0.00 3.23089925378786e-07 31 Slit Grid Source 0.4 2.27660322125924e-07 0.00 2.27660322125924e-07 32 Slit Grid Source 0.2 1.70392877892435e-07 0.00 1.70392877892435e-07 33 Slit Grid Source 0.8 1.3865513018331e-07 0.00 1.3865513018331e-07 34 Slit Grid Source 0.8 1.20242041420111e-07 0.00 1 20242041420111e-07 35 Slit Grid Source 0.8 4.17861378594033e-08 0.00 4.17861378594033e-08 36 Slit Grid Source 0.6 1.33249294509661e-08 0.00 1.33249294509661e-08 Model Source Radiance For Help, press F1 X:2.500000 Y:124.385078 Z:94.640717 mm NUM

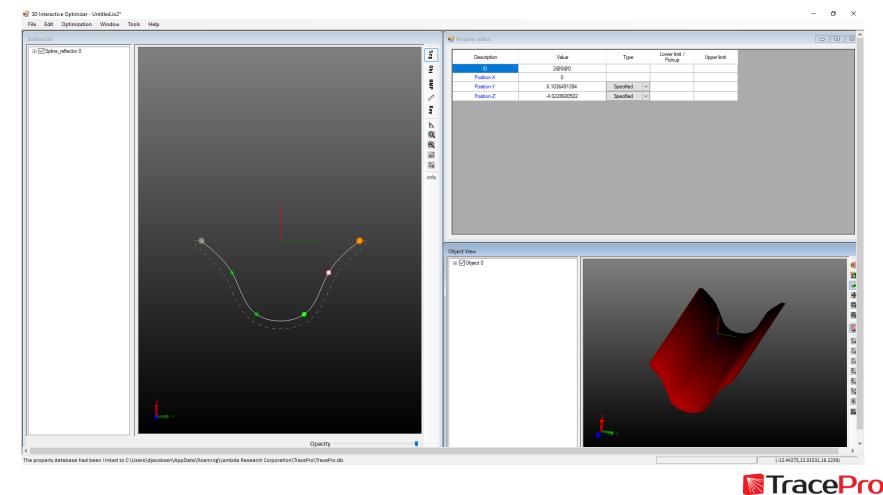


– 0 ×

TracePro – A new COM method is now available: BackgroungExecuteSchemeString. This allows the user to execute a Scheme code through the COM interface and not wait for a return from TracePro.



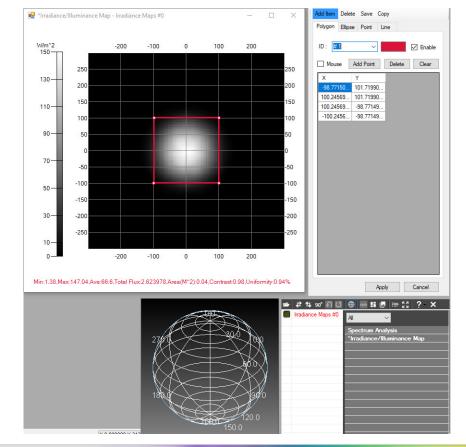
3D Interactive Optimizer – The Type D surface type can now be extruded. A Type D surface is a Spline Reflector or Conic Reflector profile.



3D Interactive Optimizer – The luminance value from a Photorealistic Rendering can now be used as an optimization operand. The options include: Average, Max, Min, or RMS luminance.

ID	Туре	Opt.	Surface	Range	Weight	Target value	MAP Op.	Src Config.	
01	Photoreali 🗸				1.0			1	
		Average Max							
		Min RMS							
		1100	,						

Analysis Toolkit – The user can now sketch areas on the Analysis Toolkit maps to be used for analysis. The Min, Max, Average, Contrast, and Uniformity values are then shown at the bottom of the map. The area sketched for analysis is also displayed on the map.





## Surface Property Generator – The Surface Property Generator now allows for importing and editing a TracePro Surface Property.

🖳 Surface Property Generator

🖳 Property edit panel	🖳 Load	Property from 1	FracePro D	_			
File • Import • Export • Vlew • Help •							
New	Catalog:	Alanod 2	2014	~			
Load > spe file / surface property file	Property r	ame: 2000AG		~	Load		
Save TracePro property database							
Exit Composite	edit panel cort + Export + View + Help +						
Deter A. R. T. Zero A. ESOF Se		poete mpored data 100.000 100.000 100.000 100.000 100.000 100.000 00010 000000	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0000	Ie ndeence: Suface nomal	50.0000 90.000	Model Imported data
	QI				Theta (degree)	_	cePro

#### Scheme – New Scheme commands have been added

Three new Scheme commands are now available:

- (analysis:candela-viewer-open ...)
- (analysis:candela-viewer-close ...)
- (analysis:candela-viewer-save ...)

