Luminit LSD Scatter Model Transmission

Summary: This article describes how to extract the correct transmission light from Luminit's LSD scatter model in OpticStudio. For more product information on the Light Shaping Diffuser®, please visit www.luminitco.com.

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Applies to:

OpticStudio

Non-Sequential Ray Tracing

Illumination & Stray Light

Article:

Luminit LSD Scatter Model Transmission

This article contains supplemental instructions for 'Luminit LSD Scatter Model User Guide' and how to set the model to get the correct transmission values. Since most illumination analyses require not only the correct pattern but also the correct amount of light to be part of the data set, we will show you how to set this with the LSD model you are using.

The OpticStudio includes algorithms to calculate the ray power at the boundary layer of different optical media. However, this is being overwritten by the LSD model at the surface. In order for the model to work with other surfaces, you must first set the coating of only the modeled LSD surface to transmit 100%. Go to the following file folder and file:

Libraries/Documents/Zemax/Coatings/

Modify the 'Coating.dat' document. Add the line 'IDEAL TRAN100 1.0 0.0'. Close the document. Now you can use the coating 'TRAN100' for the scatter surface that contains the LSD model. When you open the 'Ray Trace' panel, check the 'Use Polarization' option (Figure 2). This will now allow you to apply the effects of coatings and Fresnel surface loses on the non-LSD surfaces.

Example of transmission value with a 0.5 degree diffuser (Figures 1 to 3).

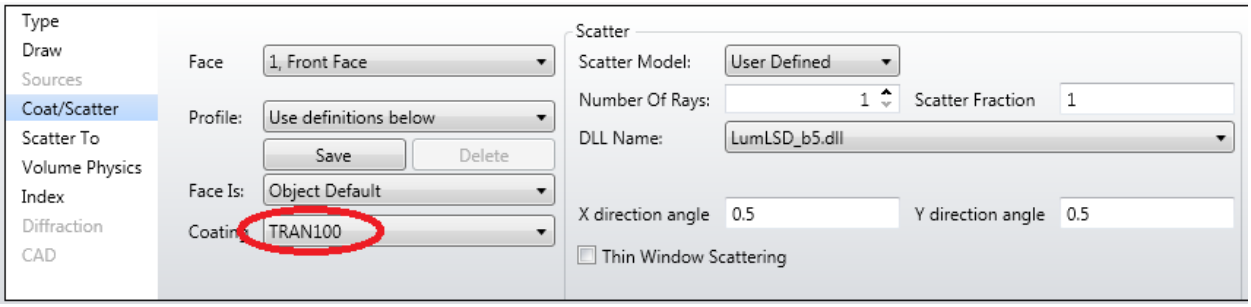


Figure 1: Surface properties control panel showing the use of a coating with 100% transmission.

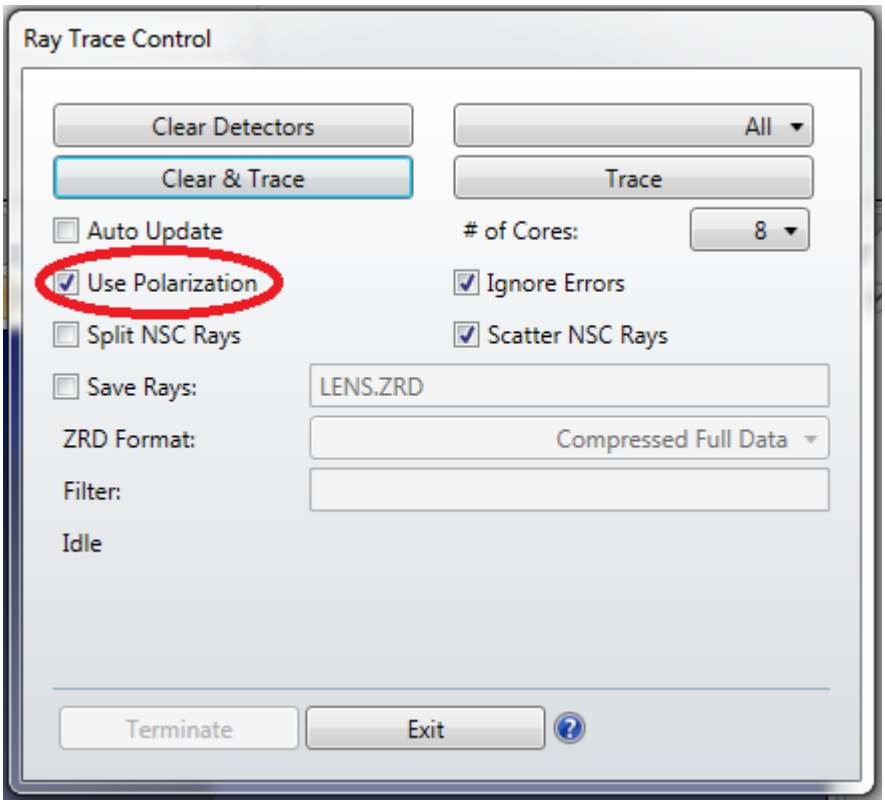
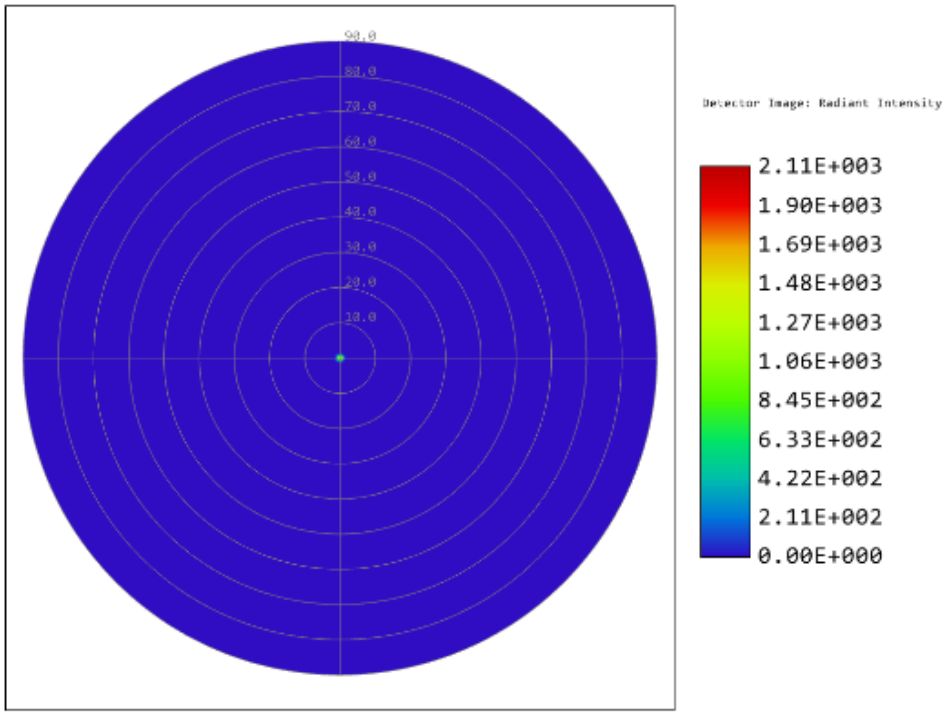


Figure 2: Ray Trace Control panel showing ‘Use Polarization’ to activate Fresnel reflection and transmission surface calculations.



Detector Image: Radiant Intensity	
7/5/2016 Detector 3, NSCG Surface 1: Tran Max polar angle: 90.00 deg, Total Hits = 9604960 Peak Intensity : [illegible] Watts/Steradian Total Power 9.225E-01 Watts	Zemax OpticStudio 14.2 SP1 LENS.ZMX Configuration 1 of 1

Figure 3: Result of Ray Trace with coating transmission 100% for LSD scatter surface (after tracing 10 million rays).

Example of transmission without any modified surfaces (Figures 4 and 5).

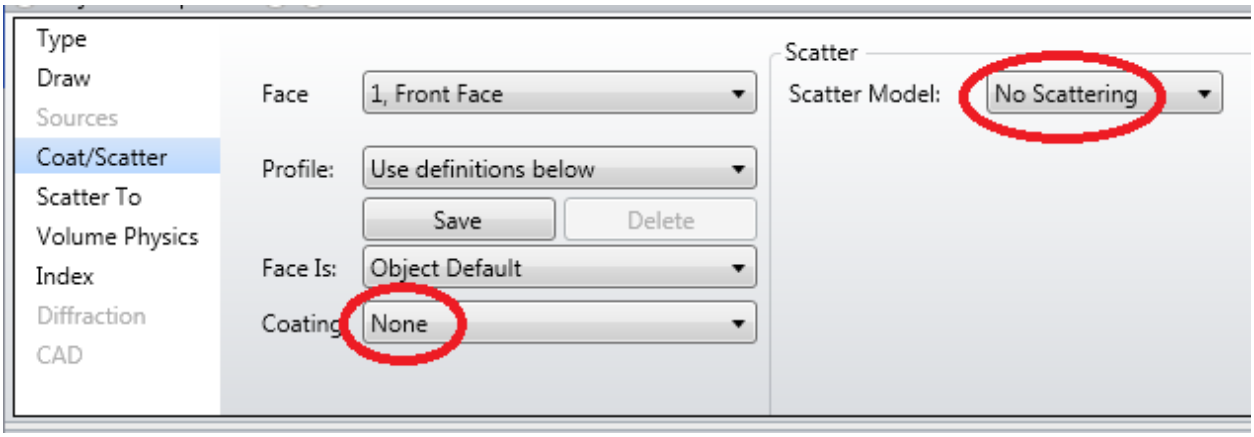
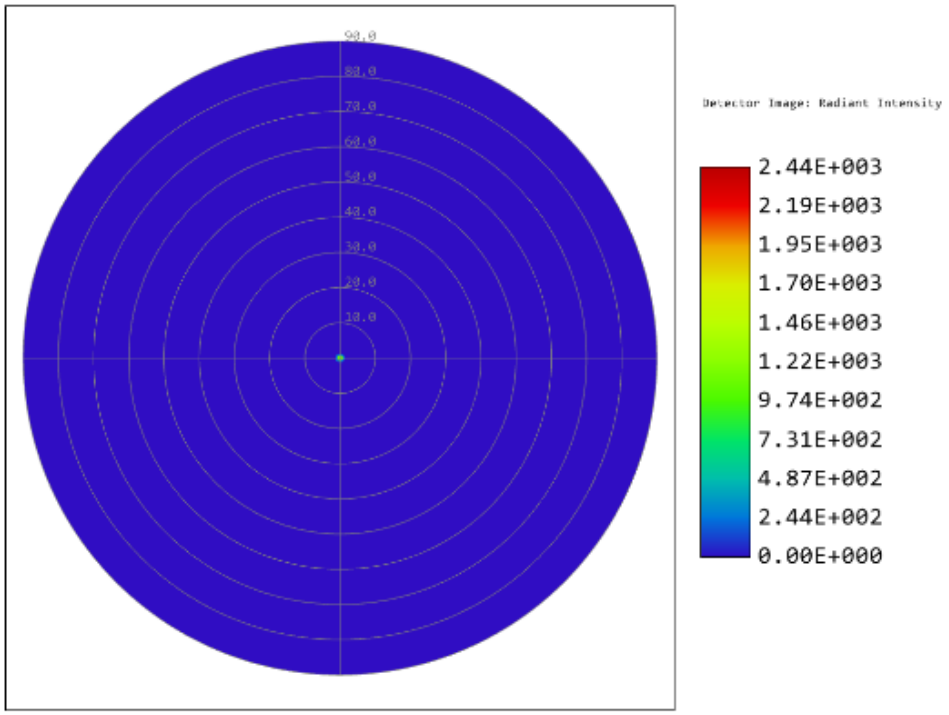


Figure 4: Surface properties control panel showing no modifications.



Detector Image: Radiant Intensity	
7/5/2016 Detector 3, NSCG Surface 1: Tran Max polar angle: 90.00 deg, Total Hits = 10000000 Peak Intensity : 2.4[illegible] Watts/Steradian Total Power 9.224E-01 Watts	Zemax OpticStudio 14.2 SP1 LENS.ZMX Configuration 1 of 1

Figure 5: Result of Ray Trace with no coatings (after tracing 10 million rays).

There is no significant power difference between the two results. The setup is correct in order to make an accurate calculation that takes into account the transmission of both the LSD scatter surface and other surfaces in the system. Please keep in mind that for transmission calculations, the light incident on the LSD surface is treated as randomly polarized.