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LucidShape LID Editing
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Author

Peter Sommer
Synopsys

Abstract

Synopsys' LucidShape® software's light intensity distribution (LID) editor is a tool for combining several existing LID files into a single target LID. Individual LIDs in the target lid can be switched on or off and transformed (stretched, shifted, rotated, scaled or mirrored) to achieve a combined LID result.

The LID data used for the combination are read from .lid files, which are typically produced by the ray tracing of previously computed optical devices.

Using the LID editor can be the quick first step before the development work begins. Instead of running lengthy simulations with a large number of optical components, one can simulate the individual components and combine their results with the LID editor to get a first estimate of possible results. This should, however, not replace the simulation of the model as a whole.

The LID Editor Dialog Boxes

The LID editor dialog box provides two tabs: one to specify and read the .lid files (Figure 1) and the other to edit the LID transformations and set the individual on/off switches (Figure 2).

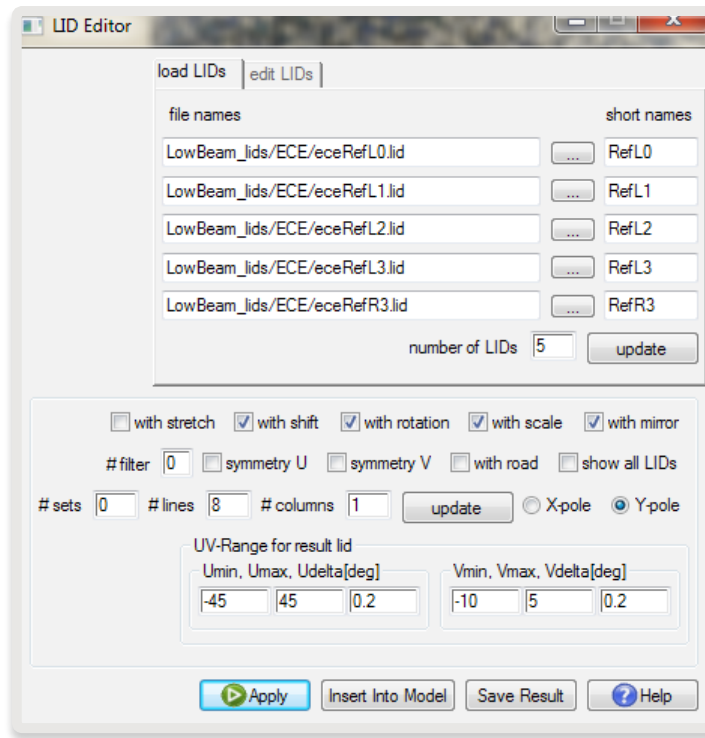You can save the LID Editor parameters for the target LID.

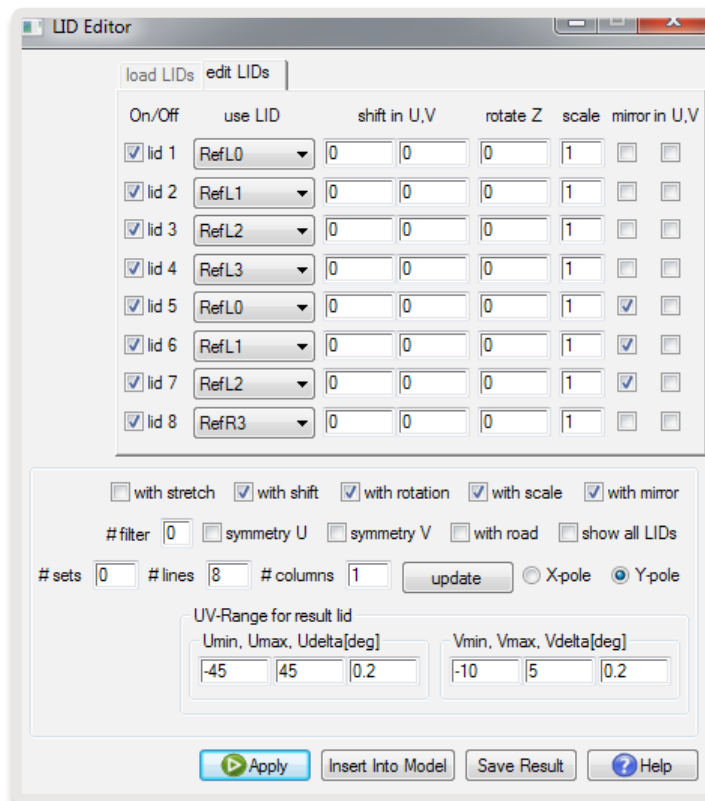**Figure 1. The *load LIDs* tab in the LID Editor dialog box**

Figure 2. The *edit LIDs* tab in the LID Editor dialog box

Example: Designing an ECE Low Beam LID

Every well designed ECE low beam reflector consists of a number of facets. Each of these facets provides a different LID. The sum of the individual LIDs is the composed ECE low beam pattern.

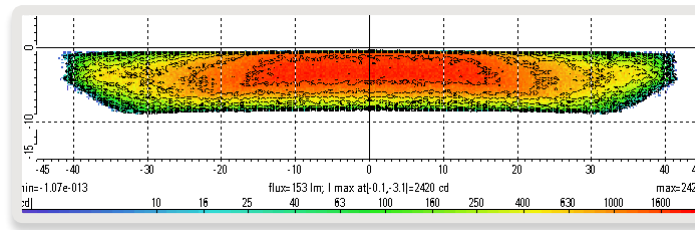We label the individual LIDs as RefL0, RefL1, RefL2, RefL3. Each LID represents a different facet of the reflector.
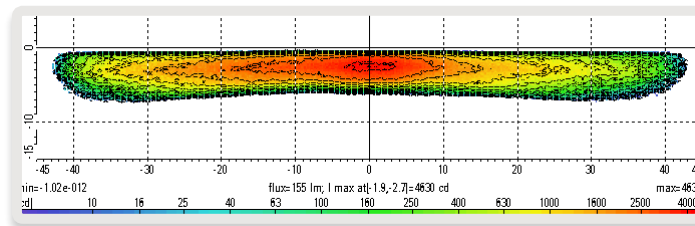

Figure 3. Light intensity distribution RefL0

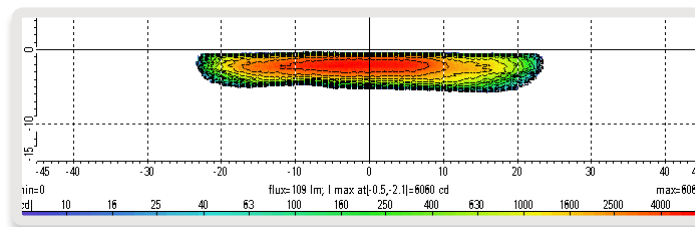**Figure 4. Light intensity distribution RefL1**

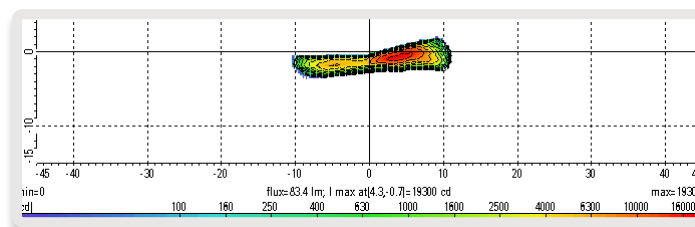**Figure 5. Light intensity distribution RefL2**

Figure 6. Light intensity distribution RefL3

These individual LIDs can be loaded into the LID editor and added to a target LID. The result is shown in Figure 7 (note that the intensity range is different for the different LIDs).
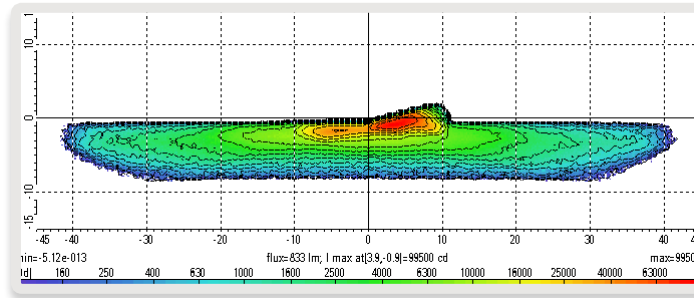

Figure 7. Light intensity distribution of the added LIDs

The resulting LID can also be projected on a road plane to make a bird's eye view.
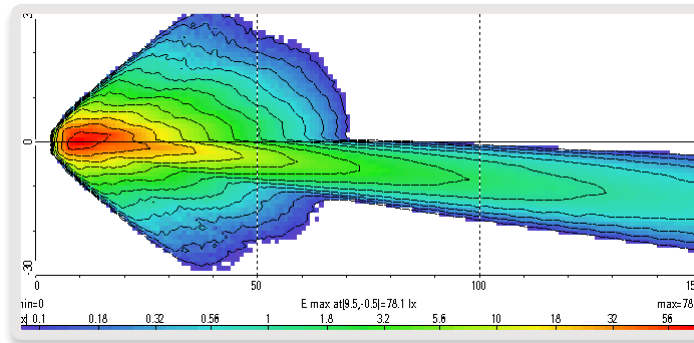

Figure 8. The resulting LID in bird's eye view

Modify the Resulting LID by Using the LID Editor

We want to modify the combined LID, as shown above in Figure 8, in such a way that:

▶ The central intensity is enhanced
▶ The range of the low beam is extended (for example, to build a motorway light)

The RefL3 LID is scaled by a value of 2.0. The resulting LID shows a higher central intensity after the scaling (degree in Figure 9 and bird's eye view in Figure 10).
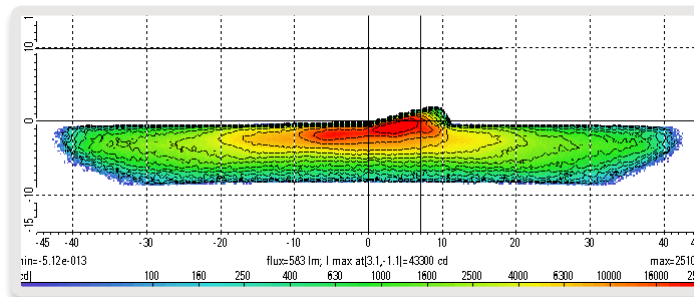

Figure 9. The light intensity distribution of the added and scaled LIDs
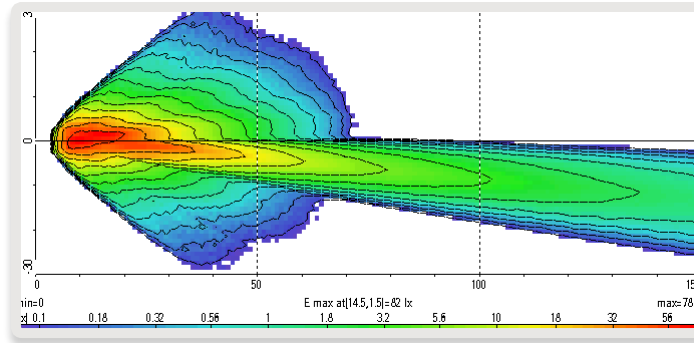
Figure 10. The resulting LID in bird's eye view

RefL0 and RefL1 are shifted one degree in V-direction. In Figure 11, one can easily see the extended range of the low beam pattern in this direction.
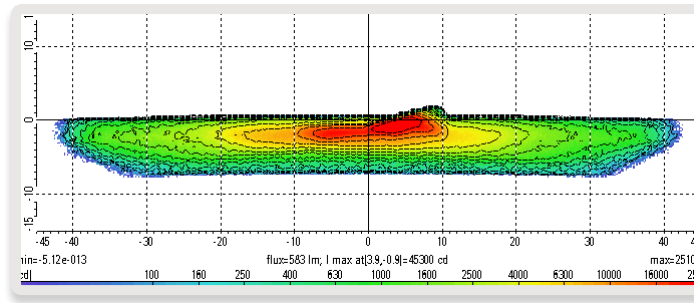

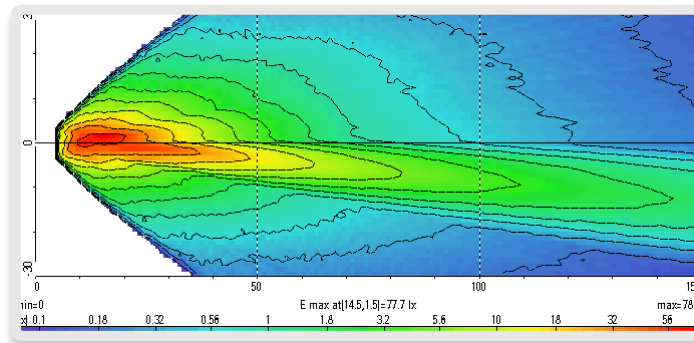**Figure 11. The light intensity distribution of the added, scaled, and shifted LIDs**

Figure 12. The resulting LID in bird's eye view
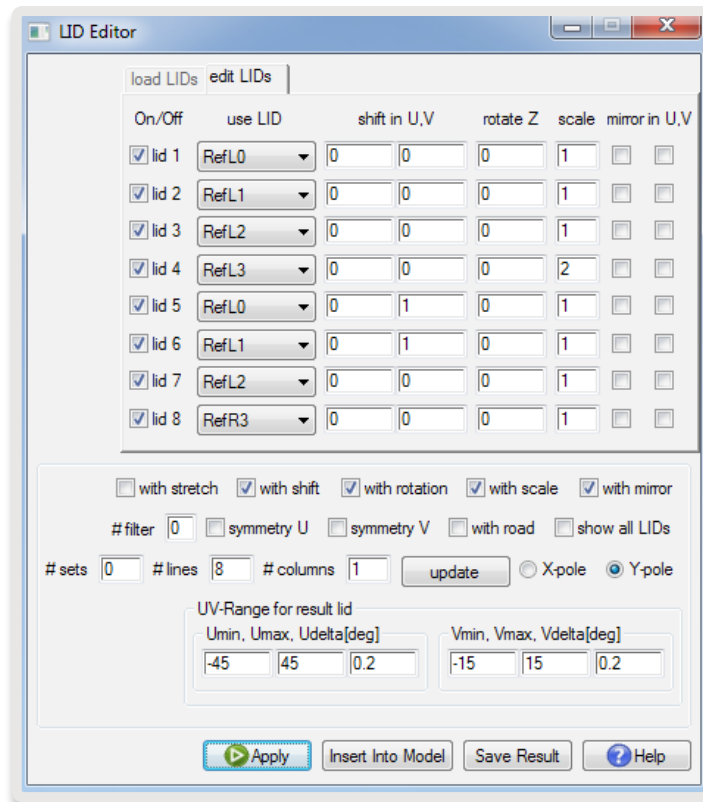
Figure 13. The *edit LIDs* dialog box with the new scale and shift values

Applications

Possible applications include the creation of street illuminations in LucidDrive which can directly import the previously created combined LIDs. Below in Figure 14, the appearance of the LIDs in LucidDrive is shown.
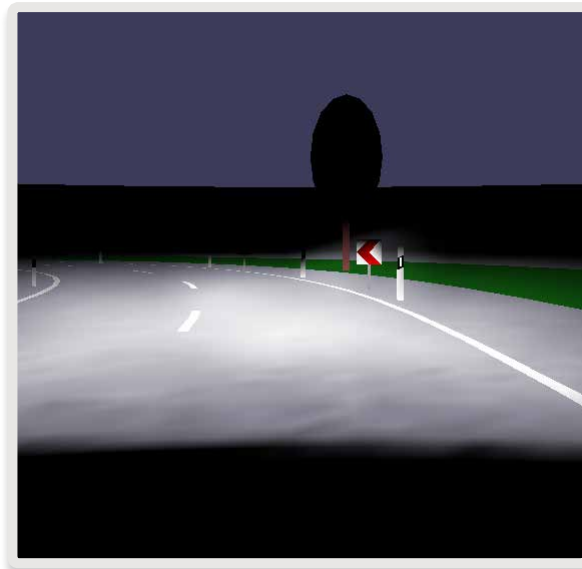

Figure 14. The light intensity distribution of the added LIDs without scaling and shifting
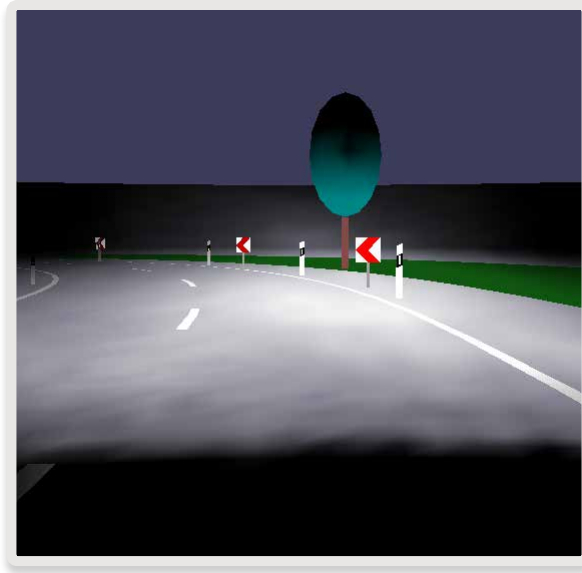
Figure 15. The light intensity distribution of the added scaled and shifted LIDs. Note the extended range of this low beam example

To Learn More

For more information on LucidShape and to request a demo, please contact Synopsys' Optical Solutions Group at (626) 795-9101 between 8:00am-5:00pm PST, visit http://optics.synopsys.com or send an email to lucidshapeinfo@synopsys.com.