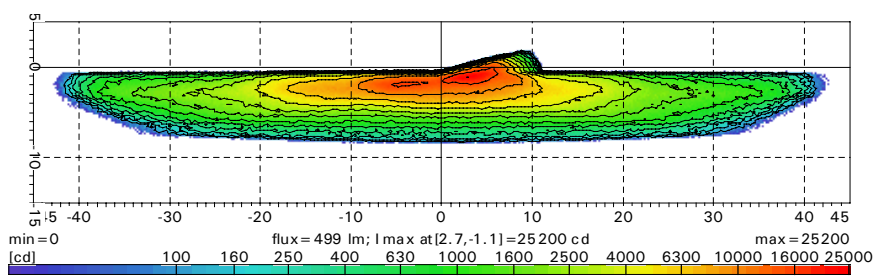


Low beam headlamp reflector



Resulting Light intensity distribution LID

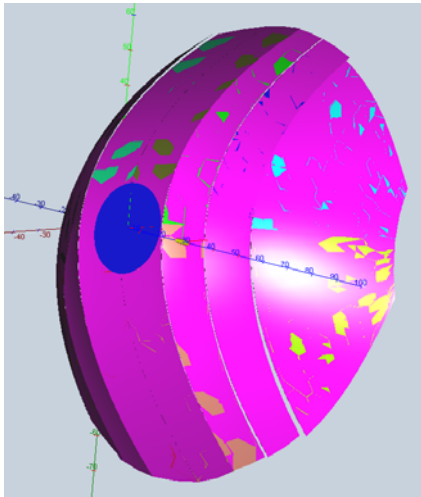
Problem:

The conversion of CAD data during the transfer from a CAD system to a simulation program can effect the precision of the surface description. This geometric deviation, can cause extreme errors in the simulation results.

This will be demonstrated by the use of the programs LucidShape, Rhino und ASAP , because here several data conversions are taken place

We start with a faceted low beam reflector which was created by LucidShape. Basis of valuation is the LucidShape simulation result.

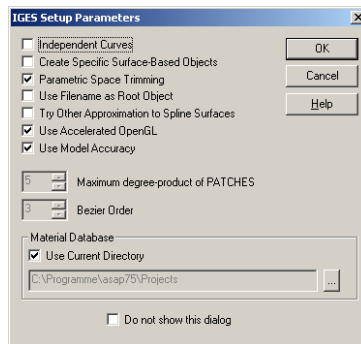
CAD data conversion



The original and the converted reflector displayed in LucidShape

Sequence:

The reflector is created in LucidShape and exported to Rhino as a *.3dm file. Then an IGES formatted files is created in Rhino and imported in ASAP. The CAD Import dialog in newer ASAP versions provides the following settings.

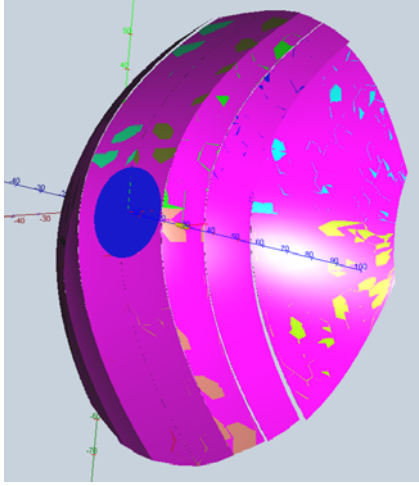


Here the Checkbox „Use Model Accuracy“ takes care for the correct import of the surface mathematic into ASAP.

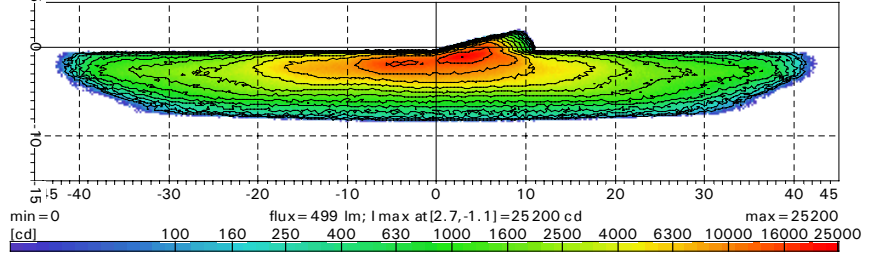
The original surface parameter checked in Rhino are:

Number of points: U=6, V=6 ; Degree: U=5, V=5

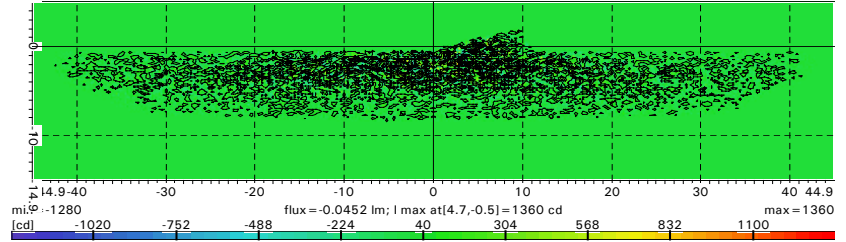
The mathematic form was not changed during the Import/ Export in ASAP. This was



The original and the converted reflector displayed in LucidShape



Light intensity distribution LID

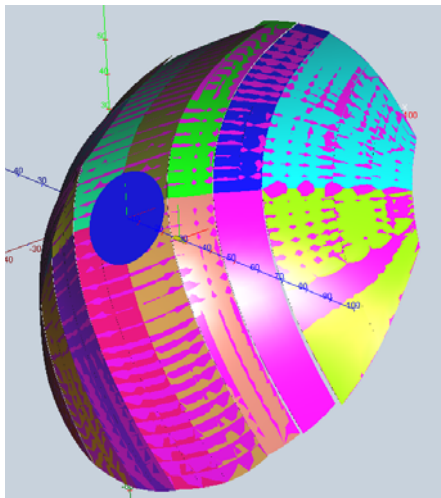


Light intensity distribution subtracted from the original LID

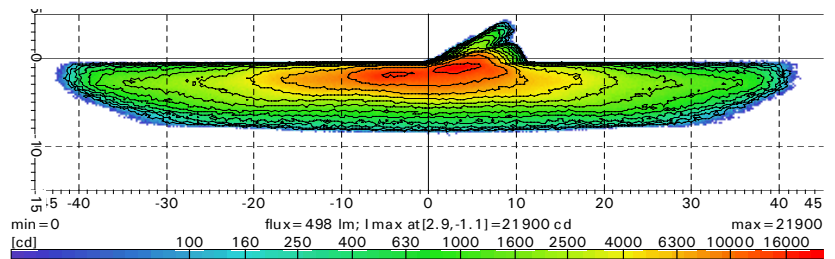
The geometry was re imported into LucidShape and simulated. The resulting Beam pattern was subtracted from the original one. The difference did not show a specific characteristic and no deviation. We can assume the normal numerical noise between 2 Monte Carlo simulation.

For a correct data conversion it is proved that the error due to the format changes is minimal.

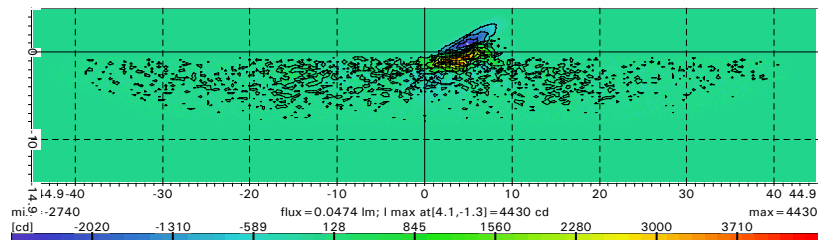
CAD data conversion



The original and the converted reflector displayed in LucidShape



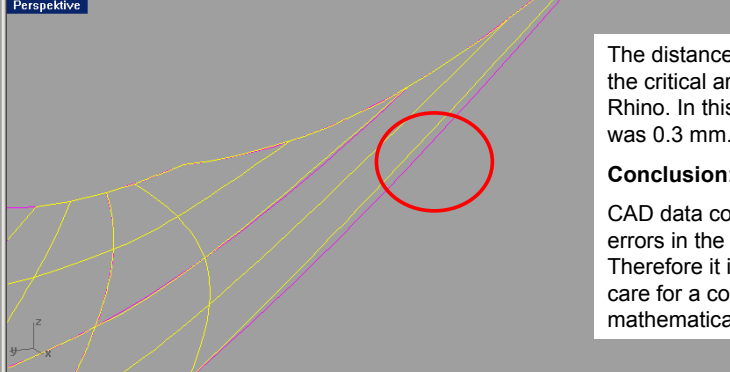
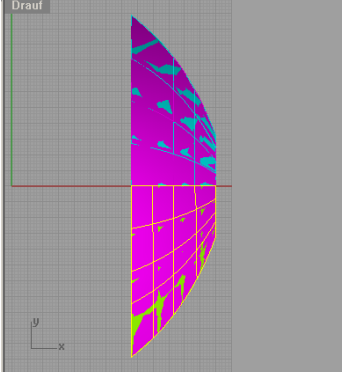
Light intensity distribution LID



Light intensity distribution subtracted from the original LID

A wrong transfer of the surface mathematical data causes differences in the surfaces and significant errors in the simulation results. If in ASAP the Checkbox „Use Model Accuracy“ is not set, the surfaces are modified and the point count and degree is reduced to: number of points: U=5, V=5 ; degree: U=2, V=2.

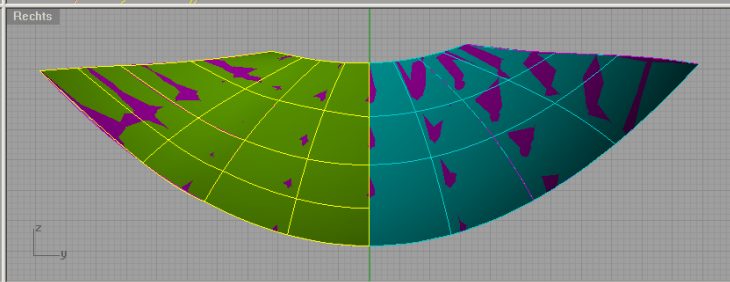
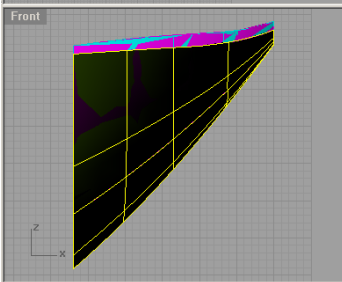
In our example the precision mainly affected the facets which create the ECE 15° finger.



The distance of the 2 surfaces in the critical areas was measured in Rhino. In this area the deviation was 0.3 mm.

Conclusion:

CAD data conversion can cause errors in the light simulation. Therefore it is important to take care for a correct transfer of the mathematical form of surfaces.



l und Deltas der Konstruktionsebene: xy = 89.9991 Höhe = 47.9145 dx = 3.33333e-006 dy = 0.204 dz = 0.226
und Deltas des Weltkoordinatensystems: xy = 89.9991 Höhe = 47.9145 dx = 3.33333e-006 dy = 0.204 dz = 0.226
d = 0.304 Millimeter

d = 0.304 Millimeter