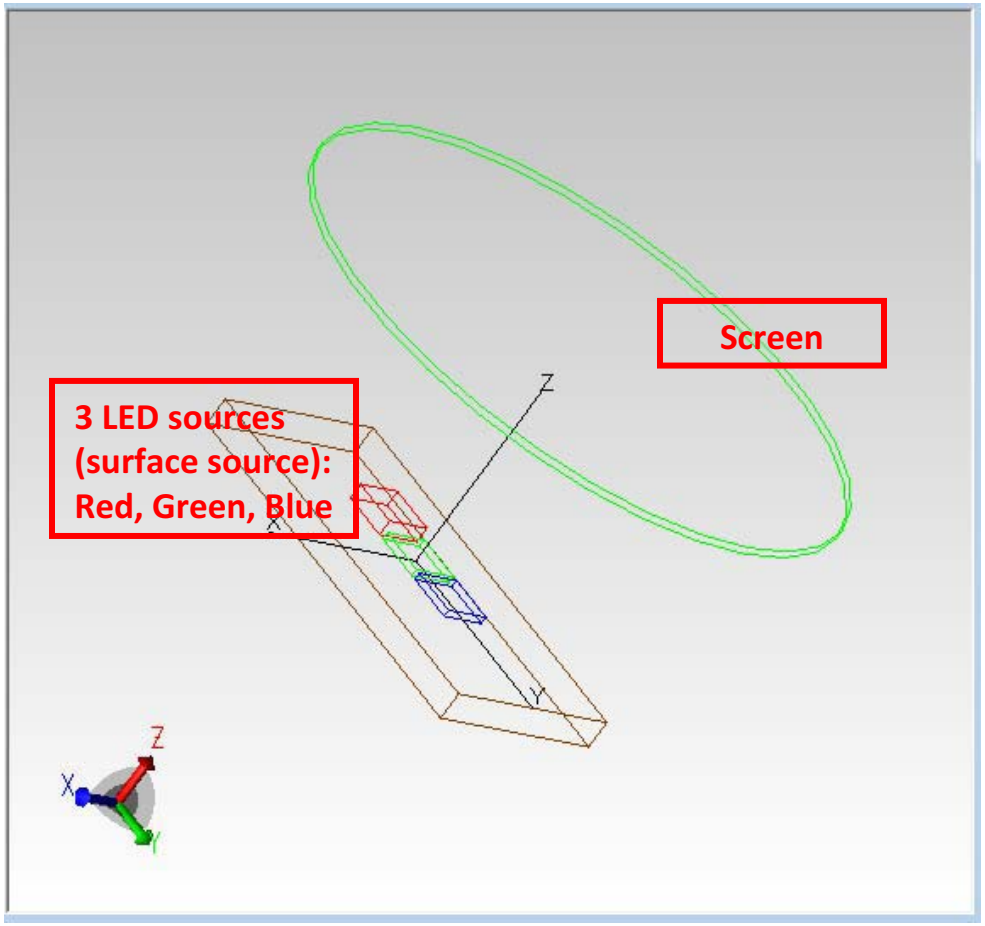
TracePro

Biaxial Lens Optimization

Lambda Research Corporation

Biaxial lens optimization

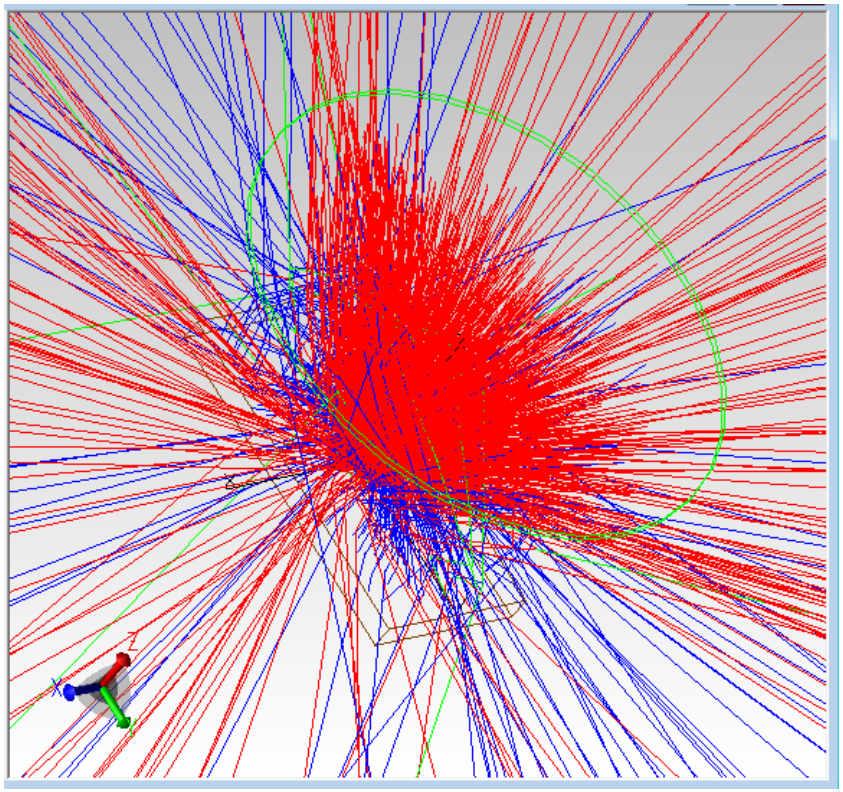
Model in TracePro (ex3.oml)



Biaxial lens optimization

Target

– Maximize the total flux on the detector surface



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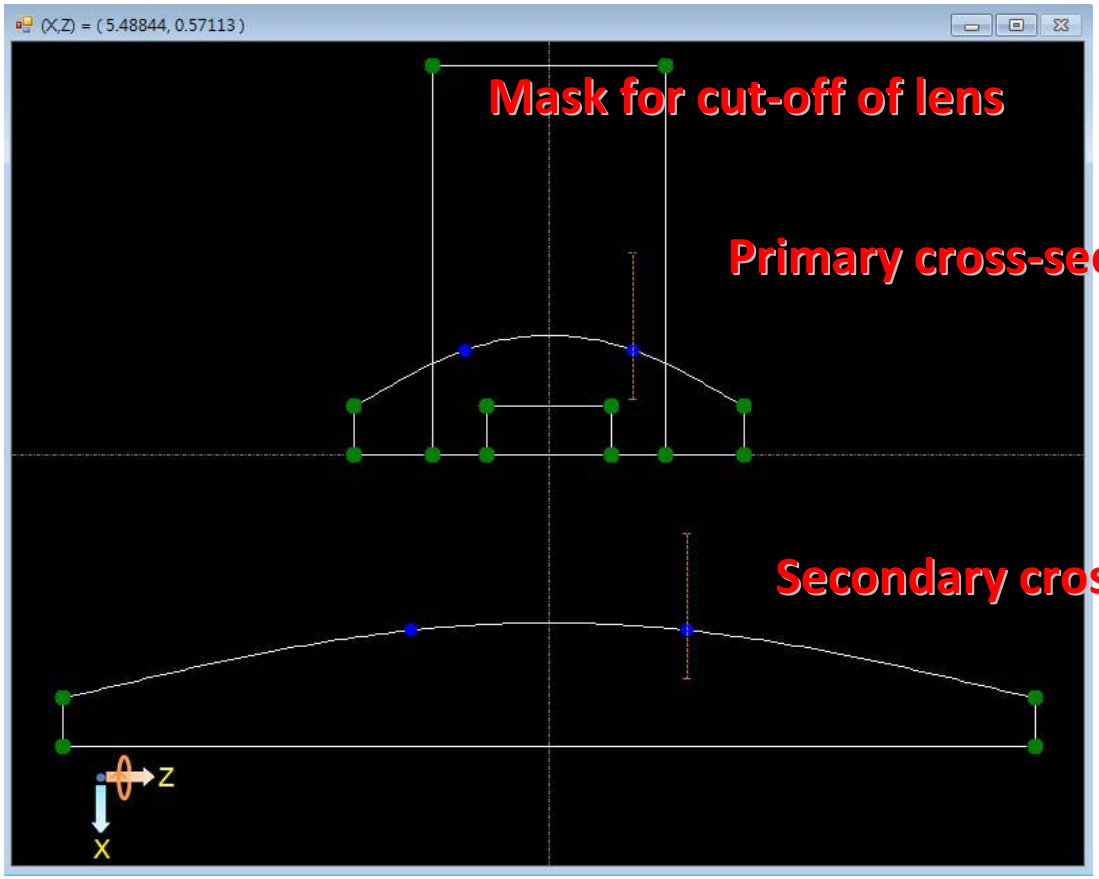

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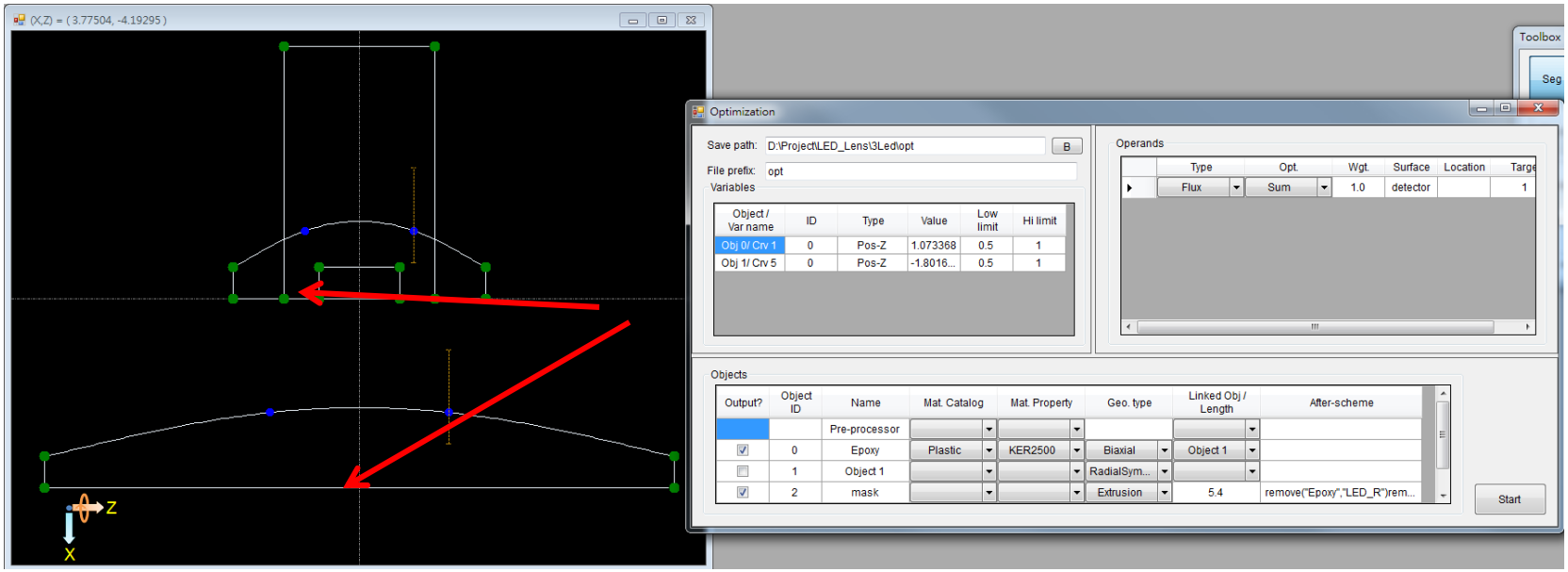
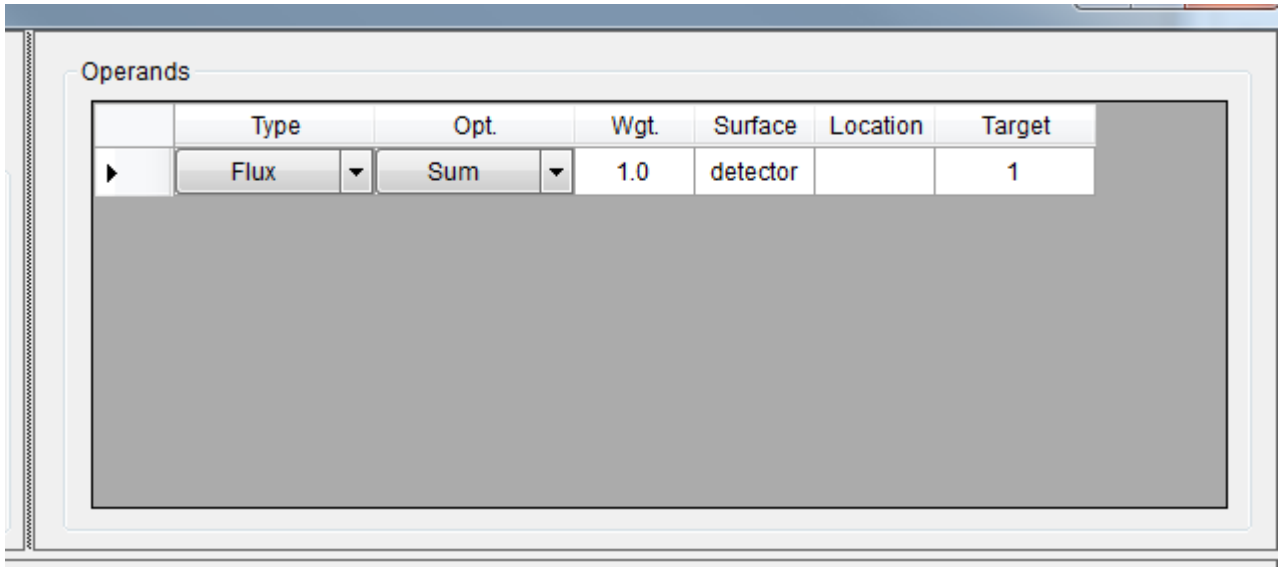


We choose y shifts for the two control point as the variables, which is enough to vary the resultant profile of the bi-axial lens.

Biaxial lens optimization

The only operand for the optimization target is the total flux on the detector surface.



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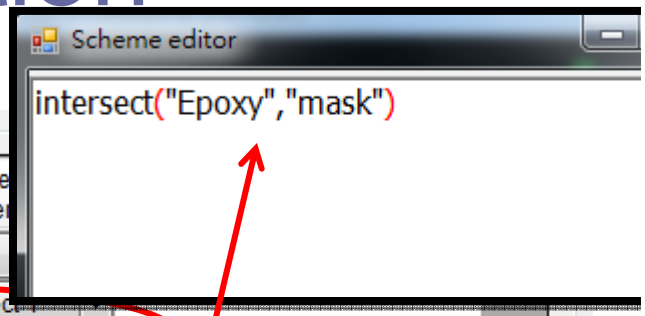
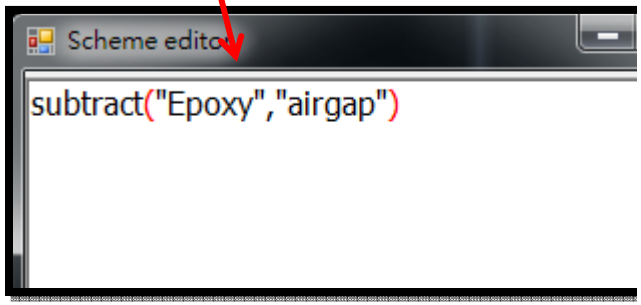
Objects

Output?	Object ID	Name	Mat. Catalog	Mat. Property	Geo. type	Linke Le	
		Pre-processor					
☑	0	Epoxy	Plastic	KER2500	Biaxial	Objec	
☐	1	Object 1			RadialSym...		
☑	2	mask			Extrusion	5.4	intersect("Epoxy","mask")
☑	4	airgap			Extrusion	4.4	subtract("Epoxy","airgap")





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1. Name the object#0 as “Epoxy” and check it to create it in TracePro.
2. Select the geometry type as “Biaxial” and its linked object should be selected as “object 1” since object 0 is the primary and object 1 is the secondary profile.
3. We don’t want to really create object 1 in TracePro, so please remember to uncheck Object 1.
4. Rename Object 2 as “mask” which is to cut the unwanted portion of Epoxy, then we need an after scheme macro to perform the cut-off.
5. Rename Object 4 as “airgap”, to make a hole in the bottom of the epoxy.

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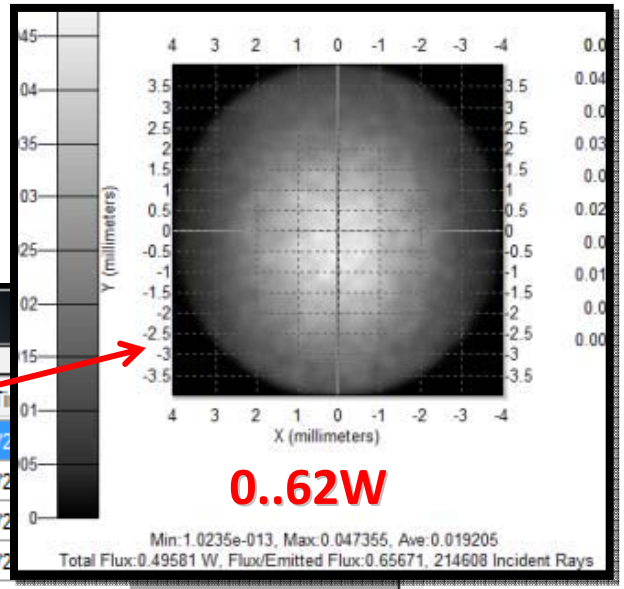
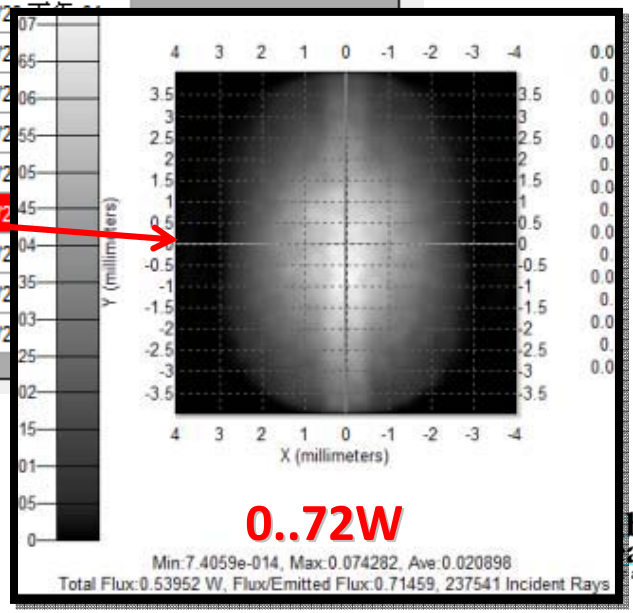
Optimization Log

ID	Err	Var.	Ti
1	0.504185	{1.0733684,-1.8016974}	2010/9/2
2	0.469615	{1.4474017,-1.4630574}	2010/9/2
3	0.483537	{1.3447365,-2.179538}	2010/9/2
4	0.465994	{1.7187698,-1.8408983}	2010/9/2
5	0.473103	{2.0414705,-1.8604989}	2010/9/2
6	0.461831	{1.821435,-1.1244177}	2010/9/2
7	0.466985	{2.0597843,-0.8016971}	2010/9/2
8	0.47087	{2.0733684,-1.5022586}	2010/9/2
9	0.464147	{1.6087521,-1.4728577}	2010/9/2
10	0.460483	{1.7114173,-0.801697	2010/9/2
11	0.460506	{1.7077411,-0.8016971}	2010/9/2
12	Invalid	{1.9241003,-0.8016971}	2010/9/2
13	Evaluating.../	{2.0733684,-0.8016971}	2010/9/2





Biaxial lens optimization

Example 4 demonstrates how to use the Interactive Optimizer for a non-radial symmetric lens. However the resultant lens created by bi-axial method is not a biconic lens which is popular in street light design and laser reshaping. The biconic lens can be accomplished in the optimizer.

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