

# Creating Source Files

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## *Requirements*

*Models:* None

*Properties:* None

*Editions:* TracePro LC, Standard or Expert

## *Introduction*

A file containing ray data can be inserted into a TracePro model and used as a source. A File Source consists of 7 columns of tabular data: XYZ starting positions for each ray, XYZ direction vectors for each ray, and flux for each ray.

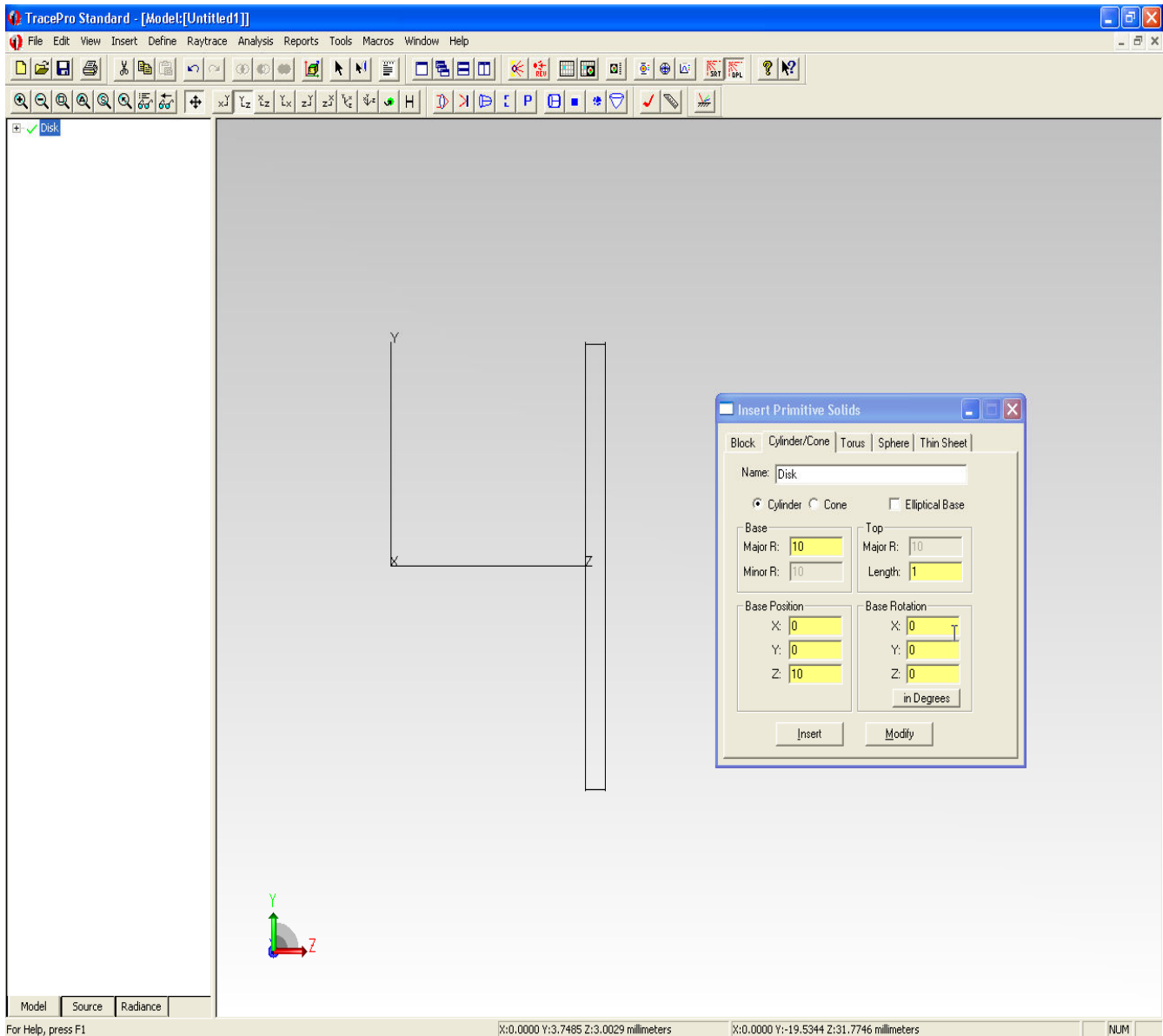
The File Source provides the capability to:

1. Incorporate measured source distribution data from the website of an LED manufacturer or Radiant Imaging into a TracePro model.
2. “Continue” a raytrace by using data incident on one surface as a source in another raytrace or model.
3. Create a source from either theoretical or measured data in another application (e.g. - text editor or spreadsheet).

This tutorial demonstrates Option 2, saving rays incident on a surface in one model and using those rays as the source in another model.

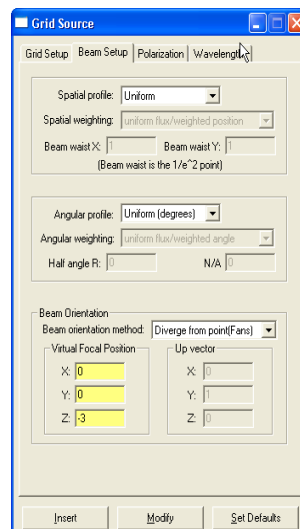
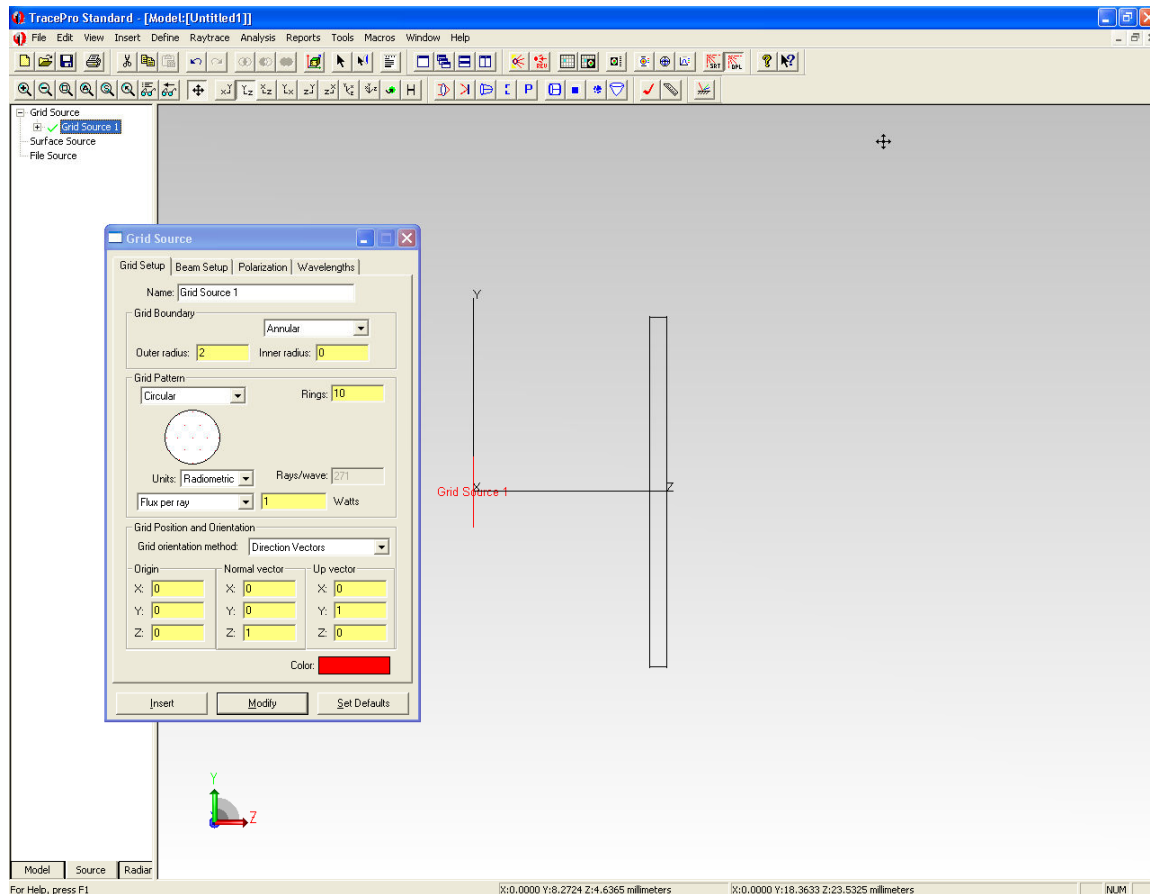
## Defining the "Target" Surface

Insert a cylinder at  $Z = 10$  by selecting Insert /Primitive Solid/Cylinder and using the values shown in the dialog box below. The surface of this disk will be used to “catch” the rays that will later be made into a Source File.



## Defining the Grid Source

Switch to the Source Tree by clicking on the Source tab in the lower left corner of the TracePro model window. Then select Define/Grid Source. Next, select “Grid Source 1” in the Source Tree to modify the source to trace the rays that will be incident on the disk. Enter the values shown in the Grid Source dialog box below and click Modify to save the changes. Click Raytrace/Trace Rays to trace the rays.



## Making the File Source

In the Model Tree, highlight Surface 1 of the disk, and then select Analysis/Incident Ray Table to view the table of incident rays for that surface.

TracePro Standard

File Edit View Define Raytrace Analysis Reports Tools Macros Window Help

Incident Ray Table:[Untitled1]

Disk Surface 1

Ray Number	Wavelength	Source	Start Ray	Ray Node	Type	History	Flux	X Pos.	Y Pos.	Z Pos.	X Vec.	Y Vec.	Z Vec.
1	0.5461	Grid Source 1	1	2		Emitted	1	0	0	10	0	0	1
2	0.5461	Grid Source 1	2	2		Emitted	1	1.02486	0	10	0.0785917	0	0.996907
3	0.5461	Grid Source 1	3	2		Emitted	1	0.512431	0.887557	10	0.0392959	0.0680624	0.996907
4	0.5461	Grid Source 1	4	2		Emitted	1	-0.512431	0.887557	10	-0.0392959	0.0680624	0.996907
5	0.5461	Grid Source 1	5	2		Emitted	1	-1.02486	2.89637e-017	10	-0.0785917	0	0.996907
6	0.5461	Grid Source 1	6	2		Emitted	1	-0.512431	-0.887557	10	-0.0392959	-0.0680624	0.996907
7	0.5461	Grid Source 1	7	2		Emitted	1	0.512431	-0.887557	10	0.0392959	-0.0680624	0.996907
8	0.5461	Grid Source 1	8	2		Emitted	1	1.88061	0	10	0.143172	0	0.989698
9	0.5461	Grid Source 1	9	2		Emitted	1	1.62865	0.940303	10	0.12399	0.0715859	0.989698
10	0.5461	Grid Source 1	10	2		Emitted	1	0.940303	1.62865	10	0.0715859	0.12399	0.989698
11	0.5461	Grid Source 1	11	2		Emitted	1	2.6574e-017	1.88061	10	0	0.143172	0.989698
12	0.5461	Grid Source 1	12	2		Emitted	1	-0.940303	1.62865	10	-0.0715859	0.12399	0.989698
13	0.5461	Grid Source 1	13	2		Emitted	1	-1.62865	0.940303	10	-0.12399	0.0715859	0.989698
14	0.5461	Grid Source 1	14	2		Emitted	1	-1.88061	5.3148e-017	10	-0.143172	0	0.989698
15	0.5461	Grid Source 1	15	2		Emitted	1	-1.62865	-0.940303	10	-0.12399	-0.0715859	0.989698
16	0.5461	Grid Source 1	16	2		Emitted	1	-0.940303	-1.62865	10	-0.0715859	-0.12399	0.989698
17	0.5461	Grid Source 1	17	2		Emitted	1	-7.9722e-017	-1.88061	10	0	-0.143172	0.989698
18	0.5461	Grid Source 1	18	2		Emitted	1	0.940303	-1.62865	10	0.0715859	-0.12399	0.989698

Model:[Untitled1]

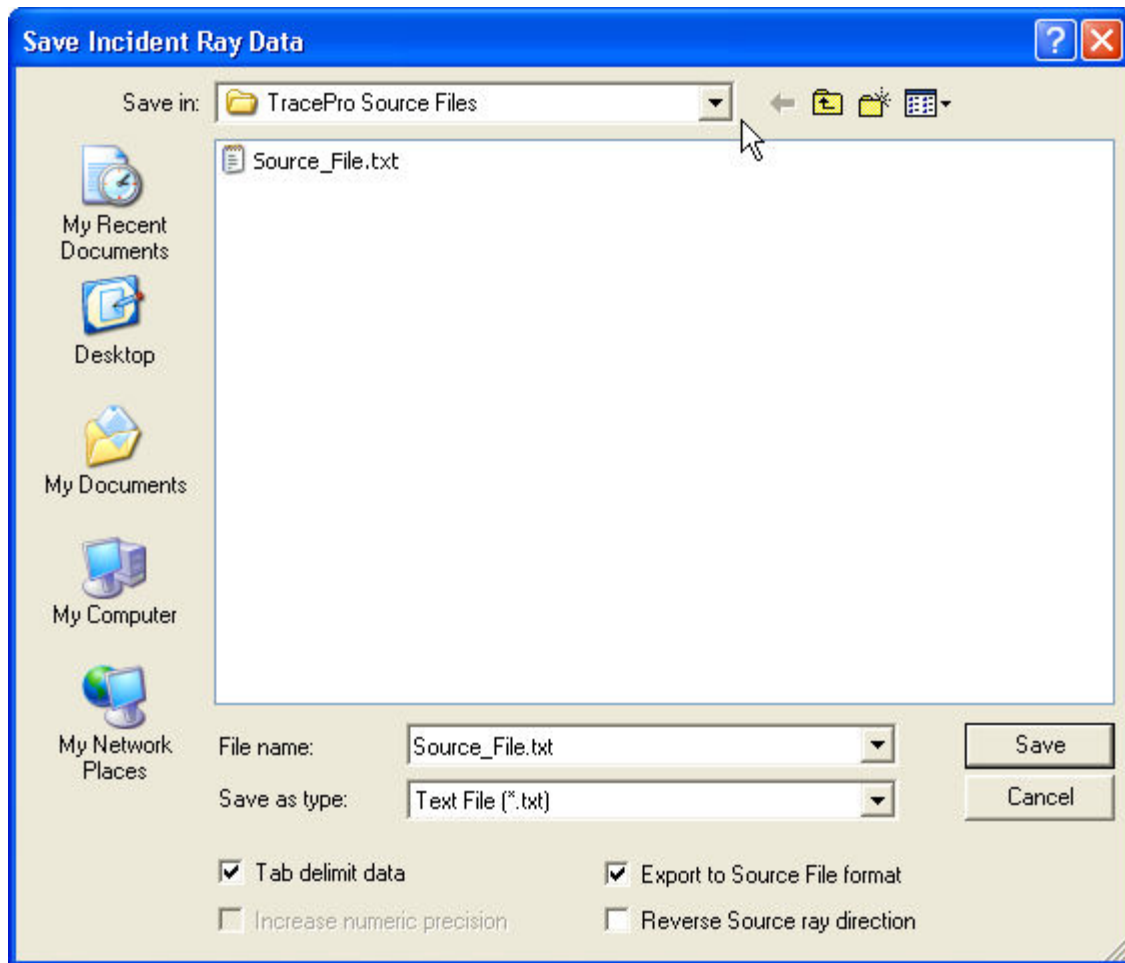
Model Tree: Disk, Surface 0, Surface 1, Surface 2, Entity 1, Cyl/Cone

Model Source Radial

For Help, press F1 | X:0.0000 Y:8.2724 Z:4.6365 millimeters | X:0.0000 Y:22.0003 Z:39.8786 millimeters | NUM

## Saving the File Source Ray Information

With the Incident Ray Table as the active window, select File/SaveAs from the menu, check the box for "Export to Source File format", and then save the file as a text file.



## Validating and Viewing the Ray Data

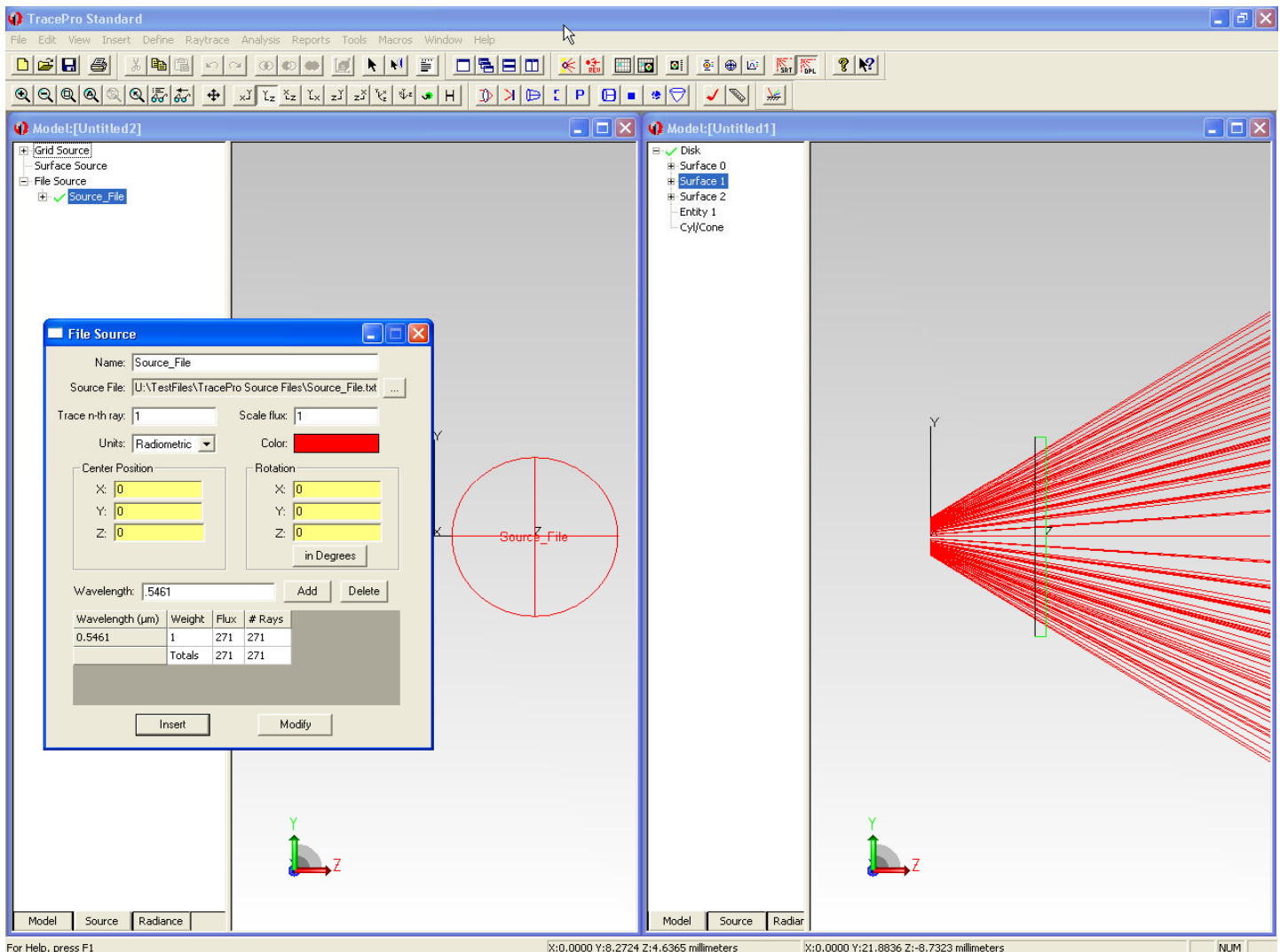
Once the file is saved, you can open it and/or edit it using a text editor or a spreadsheet application. The first 7 lines are Header Information and the source ray data begins on row 8 as shown below.

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Source file:												
2													
3	TracePro Release: 5 0 0												
4	Data for Disk Surface 1												
5	Linear Units in mm												
6	Data generated at 13:52:35 January 30, 2009												
7	X Pos.	Y Pos.	Z Pos.	X Vec.	Y Vec.	Z Vec.	Inc Flux						
8	0.00E+00	0.00E+00	1.00E+01	0.00E+00	0.00E+00	1.00E+00	1.00E+00						
9	1.02E+00	0.00E+00	1.00E+01	7.86E-02	0.00E+00	9.97E-01	1.00E+00						
10	5.12E-01	8.88E-01	1.00E+01	3.93E-02	6.81E-02	9.97E-01	1.00E+00						
11	-5.12E-01	8.88E-01	1.00E+01	-3.93E-02	6.81E-02	9.97E-01	1.00E+00						
12	-1.02E+00	2.90E-17	1.00E+01	-7.86E-02	0.00E+00	9.97E-01	1.00E+00						
13	-5.12E-01	-8.88E-01	1.00E+01	-3.93E-02	-6.81E-02	9.97E-01	1.00E+00						
14	5.12E-01	-8.88E-01	1.00E+01	3.93E-02	-6.81E-02	9.97E-01	1.00E+00						
15	1.88E+00	0.00E+00	1.00E+01	1.43E-01	0.00E+00	9.90E-01	1.00E+00						
16	1.63E+00	9.40E-01	1.00E+01	1.24E-01	7.16E-02	9.90E-01	1.00E+00						
17	9.40E-01	1.63E+00	1.00E+01	7.16E-02	1.24E-01	9.90E-01	1.00E+00						
18	2.66E-17	1.88E+00	1.00E+01	0.00E+00	1.43E-01	9.90E-01	1.00E+00						
19	-9.40E-01	1.63E+00	1.00E+01	-7.16E-02	1.24E-01	9.90E-01	1.00E+00						
20	-1.63E+00	9.40E-01	1.00E+01	-1.24E-01	7.16E-02	9.90E-01	1.00E+00						
21	-1.88E+00	5.31E-17	1.00E+01	-1.43E-01	0.00E+00	9.90E-01	1.00E+00						
22	-1.63E+00	-9.40E-01	1.00E+01	-1.24E-01	-7.16E-02	9.90E-01	1.00E+00						
23	-9.40E-01	-1.63E+00	1.00E+01	-7.16E-02	-1.24E-01	9.90E-01	1.00E+00						
24	-7.97E-17	-1.88E+00	1.00E+01	0.00E+00	-1.43E-01	9.90E-01	1.00E+00						
25	9.40E-01	-1.63E+00	1.00E+01	7.16E-02	-1.24E-01	9.90E-01	1.00E+00						
26	1.63E+00	-9.40E-01	1.00E+01	1.24E-01	-7.16E-02	9.90E-01	1.00E+00						
27	2.77E+00	0.00E+00	1.00E+01	2.09E-01	0.00E+00	9.78E-01	1.00E+00						
28	2.61E+00	9.49E-01	1.00E+01	1.96E-01	7.14E-02	9.78E-01	1.00E+00						
29	2.12E+00	1.78E+00	1.00E+01	1.60E-01	1.34E-01	9.78E-01	1.00E+00						
30	1.39E+00	2.40E+00	1.00E+01	1.04E-01	1.81E-01	9.78E-01	1.00E+00						
31	4.82E-01	2.73E+00	1.00E+01	3.62E-02	2.05E-01	9.78E-01	1.00E+00						
32	-4.82E-01	2.73E+00	1.00E+01	-3.62E-02	2.05E-01	9.78E-01	1.00E+00						
33	-1.39E+00	2.40E+00	1.00E+01	-1.04E-01	1.81E-01	9.78E-01	1.00E+00						
34	-2.12E+00	1.78E+00	1.00E+01	-1.60E-01	1.34E-01	9.78E-01	1.00E+00						
35	-2.61E+00	9.49E-01	1.00E+01	-1.96E-01	7.14E-02	9.78E-01	1.00E+00						
36	-2.77E+00	7.84E-17	1.00E+01	-2.09E-01	0.00E+00	9.78E-01	1.00E+00						
37	-2.61E+00	-9.49E-01	1.00E+01	-1.96E-01	-7.14E-02	9.78E-01	1.00E+00						
38	-2.12E+00	-1.78E+00	1.00E+01	-1.60E-01	-1.34E-01	9.78E-01	1.00E+00						
39	-1.39E+00	-2.40E+00	1.00E+01	-1.04E-01	-1.81E-01	9.78E-01	1.00E+00						
40	-4.82E-01	-2.73E+00	1.00E+01	-3.62E-02	-2.05E-01	9.78E-01	1.00E+00						
41	4.82E-01	-2.73E+00	1.00E+01	3.62E-02	-2.05E-01	9.78E-01	1.00E+00						
42	1.39E+00	-2.40E+00	1.00E+01	1.04E-01	-1.81E-01	9.78E-01	1.00E+00						
43	2.12E+00	-1.78E+00	1.00E+01	1.60E-01	-1.34E-01	9.78E-01	1.00E+00						
44	2.61E+00	-9.49E-01	1.00E+01	1.96E-01	-7.14E-02	9.78E-01	1.00E+00						
45	3.68E+00	0.00E+00	1.00E+01	2.72E-01	0.00E+00	9.62E-01	1.00E+00						
46	3.55E+00	9.51E-01	1.00E+01	2.63E-01	7.04E-02	9.62E-01	1.00E+00						
47	3.18E+00	1.84E+00	1.00E+01	2.36E-01	1.36E-01	9.62E-01	1.00E+00						
48	2.60E+00	2.60E+00	1.00E+01	1.92E-01	1.92E-01	9.62E-01	1.00E+00						

## Inserting the File Source in a New Model

To use this Source File in a new TracePro file, open a new model window, then select Define/File Source, enter a name for the source, click the button and locate the Source File, add a wavelength for the source, and then click Insert. If you insert the source at the origin (0, 0, 0), the rays will emit from the Z = 10 plane, which is in the same location of the collection surface (the Disk). You can think of the “Center Position” in the dialog as an offset to the starting position of the rays in the Source File. For example, if you wanted these rays to emit from Z = 20, then you would insert the source at (0, 0, 10). For the purpose of this example, the source is at the inserted origin.

Note that the Source File is represented by a sphere. The sphere is a “best fit” that surrounds the starting positions of all the rays. It has no meaning in the model other than as a visual place holder for the rayset.



## Ray Tracing the File Source in a New Model

To trace the rays from the File Source, right click on “Source File” in the Source Tree and then click “Trace Selection” to see the rays emit from the starting positions and directions specified in the Source File

