

1.0 Example: Creating a Radiographic Plot.

This example will create two radiographic plots of a sphere of U235 encased in a sphere of lead. *Figure 1-1* shows the result.

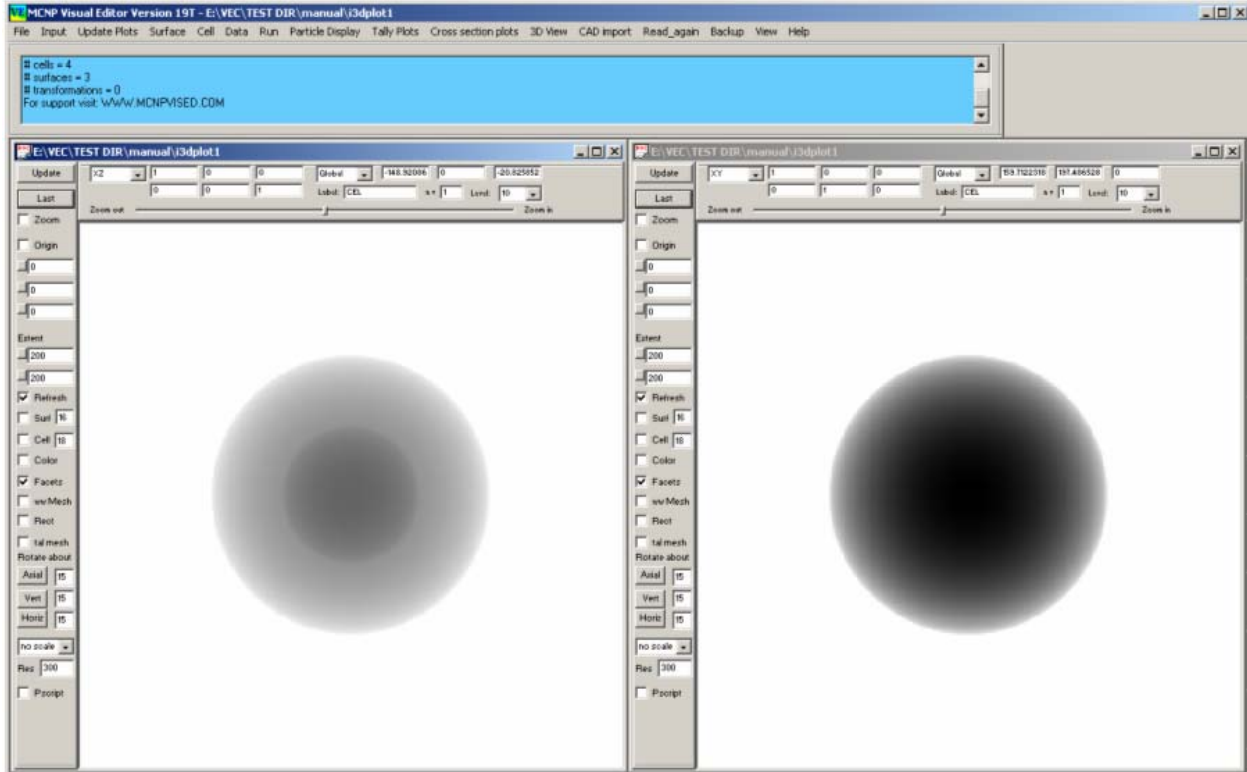


Figure 1-1 Radiographic Plot of a Sphere of U235 Encased in a Sphere of Lead.

Start the Visual Editor

Click on File...Open... and select the input file i3drad1.

Click on Update Plots.

On both plot windows, set the Extents to 200 (See *Figure 1-2*).

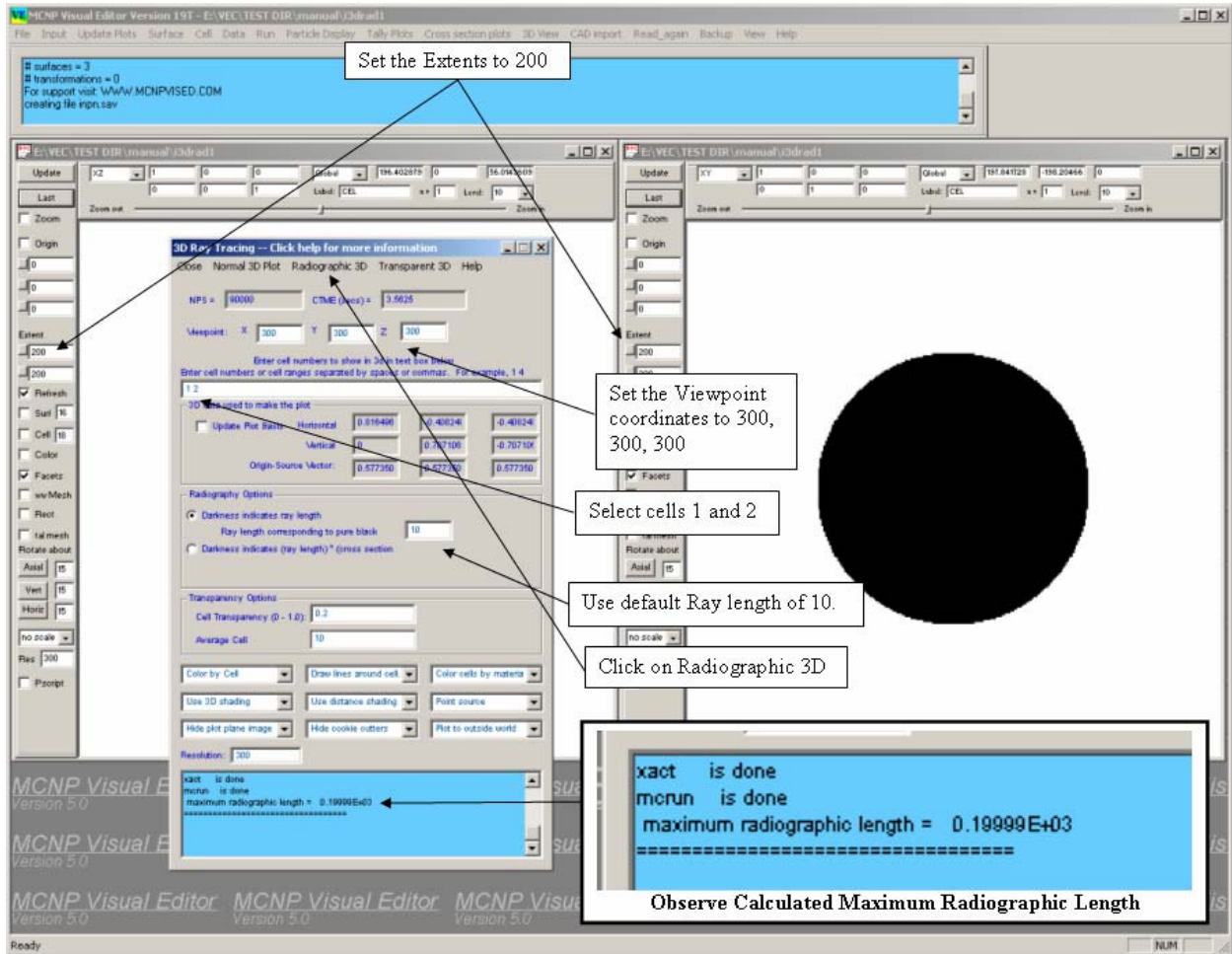


Figure 1-2 Initial Radiographic Plot

This input file contains three spheres. The inside sphere is uranium. It is surrounded by a sphere of lead. An outer sphere of air is added to allow for a viewpoint. For the plotting to work, the viewpoint must be inside a cell that is not of zero importance (the outside world). Generally, to create the 3D plots, a large sphere must be added to the geometry to contain the viewpoint.

On the Visual Editor Main Menu, **Click on 3D View...Ray Traced Image.**

Verify that the Right Plot Window is the active window.

On the 3D Ray Tracing Panel, **set the x coordinate of the Viewpoint to 300.**

On the 3D Ray Tracing Panel, **set the y coordinate of the Viewpoint to 300.**

On the 3D Ray Tracing Panel, **set the z coordinate of the Viewpoint to 300.**

The x, y, and z coordinates of 300 place the viewpoint well outside the sphere of lead which has a radius of 100 but well inside the sphere of air which has a radius of 5000. This is required. The z coordinate of 300 raises it off the plot plane which is at zero for this xy plot.

Type cells 1 and 2 in the Cell Numbers to Plot box.

Use the default ray length of 10.

On the 3D Ray Tracing Panel Menu, Click on **Radiographic 3D Plot**.

Once the sphere has been plotted, observe the maximum radiographic length as printed in the bottom of the 3D Ray Tracing Panel. That portion of the panel is shown in a magnified view in *Figure 1-2*. The value for that length is approximately 200.

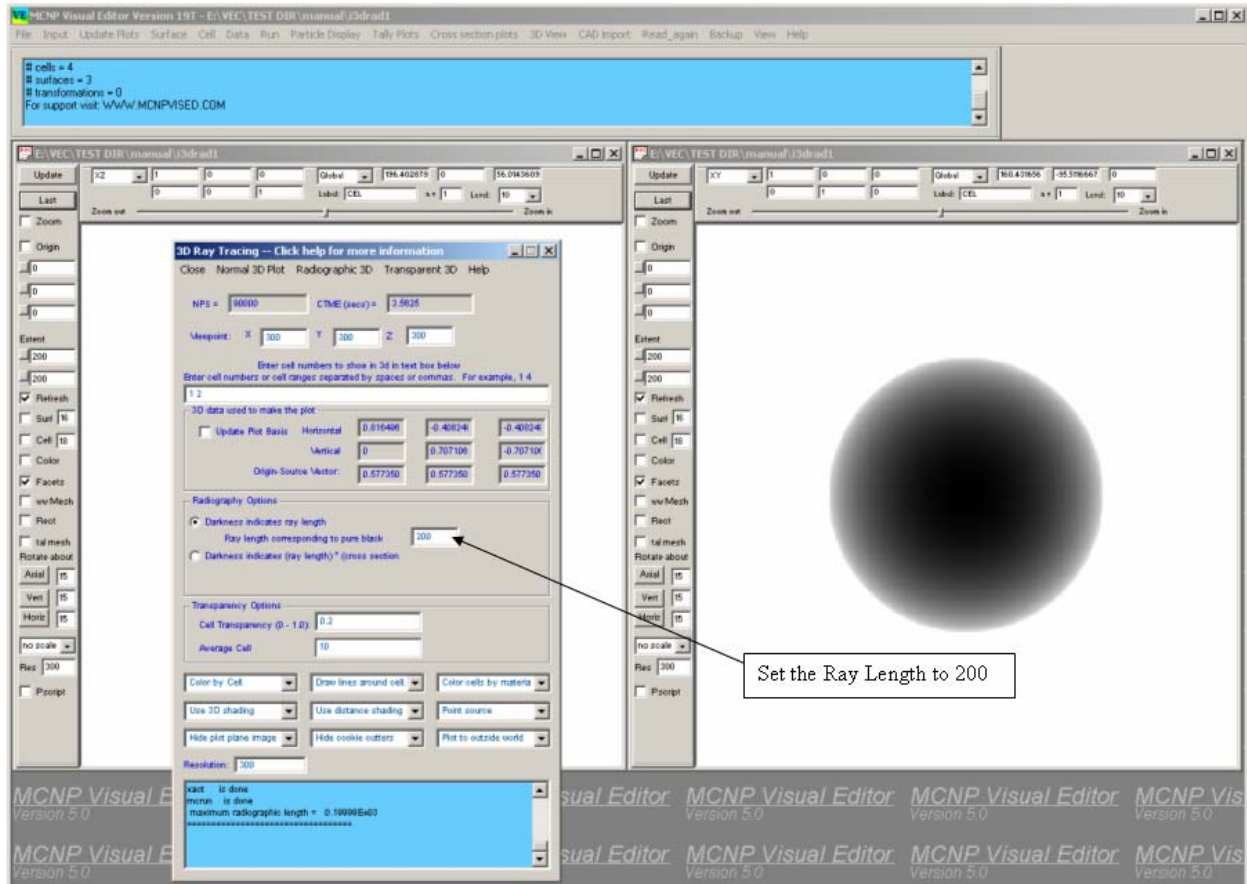


Figure 1-3 3D Radiographic Plot with Corrected Ray Length

Type **200** in the **Ray Length Corresponding to Pure Black** box.

Click on **Radiographic 3D**. *Figure 1-3* shows the result.

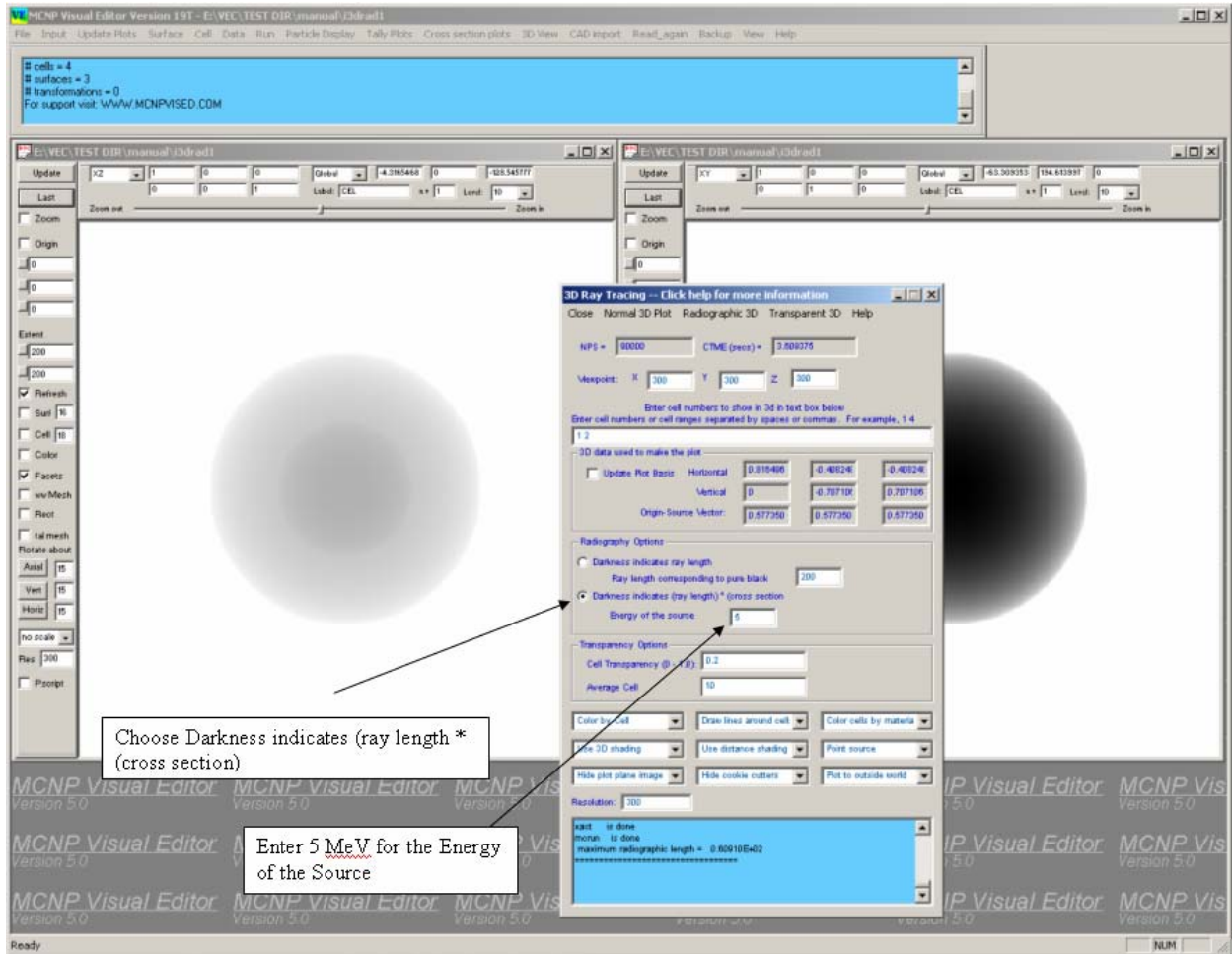


Figure 1-4 3D Radiographic Plot with Darkness = Ray Length * Cross Section

Click to Select the Left Plot Window as the active plot window.

Move the 3D Ray Tracing Panel so that the Left Plot Window is visible.

Click to select the **Darkness indicates (ray length) * (cross section)** option.

Enter 5 MeV as the Energy of the Source.

Click on **Radiographic 3D**. *Figure 1-4* shows the result.

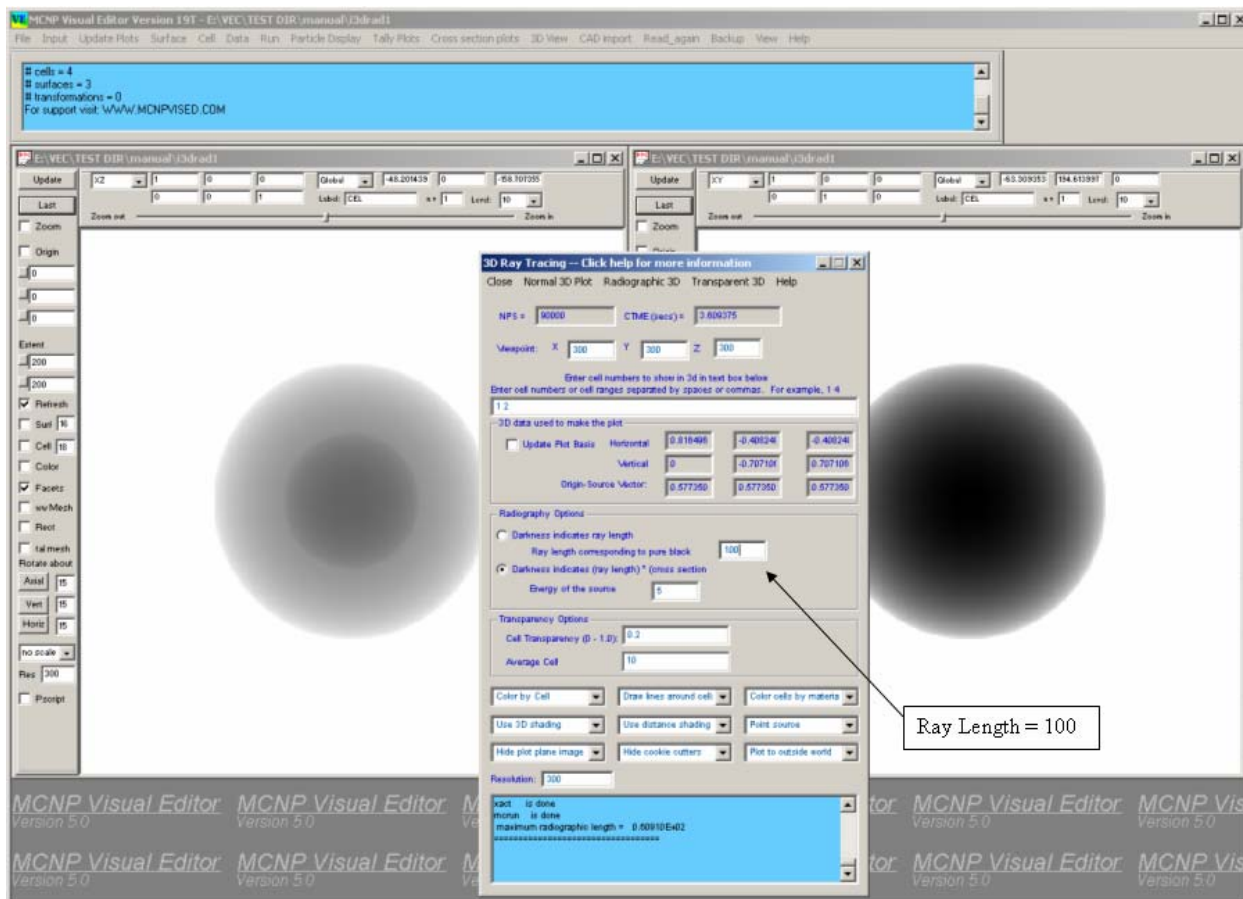


Figure 1-5 3D Radiographic Plot with Adjusted Ray Length.

When the Darkness indicates (ray length) * (cross section) option is selected, the plot often appears too light when the maximum radiographic length given by MCNP is used. In Figure 1-5, the Ray Length corresponding to pure black is set to 100.

In the **Ray Length corresponding to Pure Black** text box, **Type 100.**

Click on 3D Radiographic Plot. *Figure 1-5* shows the result.