

CODE V Assignment #1

The first assignment is to complete a couple of tutorials that are included in the CODE V program. The tutorials lead you through a couple of typical applications of the software, step by step. I have found that it is useful to go through the tutorials several times. Ideally, you should eventually be able to do all the steps in a tutorial without using the guide. My experience was that I spent about 30-45 minutes doing it the first time, and now I can do it in less than 5.

To access the tutorials, first start the CODE V program by finding it in the start menu, or clicking on the icon. Go to the Help menu and click on Code V Reference Manual. Now click on Test Drive. Read through the introduction and general comments about the user interface. The first tutorial starts on page 15.

Session 1 A Few Quick Clicks

In this tutorial, you will start with an existing lens system. Then you will decrease its f-number, which is the same thing as making its aperture larger. Doing this will screw up the lens' performance. So you will run an optimization procedure to fix this.

Make notes about the Ray Aberration Plot and the Quick Spot Diagram for the lens system before and after optimization. Turn this in.

Session 2 Starting from Scratch

In this tutorial, you will input the required data to design a Cassegrain telescope from scratch (pat yourself on the back). You will do this by typing some numbers into the Lens Data Manager (-90, -30, 40, -40). Make a dimensioned drawing of the reflector system that shows what these four numbers represent. Turn in your drawing.

You will first draw these reflectors as sections of a sphere, but you know that spherical surfaces do not focus parallel rays to a point (they come close in certain approximations). To improve the performance of your telescope, you will change the spherical surfaces into conic (parabolic) surfaces. And you will run an optimization procedure that will vary certain defined variables to maximize performance.

Make notes about the Quick Best Focus and the Point Spread Function for the lens system before and after optimization. Turn this in.