

CODE V Assignment #2

In this assignment you will design a camera lens that will satisfy certain specifications, such as desired focal length, f-number, field of view, and image sharpness. Instead of drawing the lens system from scratch, like you did for the f/10 cassegrain telescope, you will start with an existing lens design that has similar properties. You will find this lens by searching through a database of existing designs that is part of the CODE V installation, and you will identify one that is reasonably close to your desired design. You will then modify the design to meet your specific requirements.

This assignment is based on a tutorial in the CODE V help menu. To access the tutorial, open CODE V. Under the help menu, click on [CODE V Reference Manual](#). Now click on [Introductory User's Guide](#). A PDF document should open. This assignment covers pages 17-42 of this document.

Follow the steps laid out in the tutorial, making notes as you go along. Make sketches of the ray aberration curves that you produce and interpret these results (what exactly does a ray aberration curve tell you). Compare the size of the CCD pixel, the Airy disk diameter, and the Modulation Transfer Function for this camera. Which of these should be smallest to maximize the sharpness of the camera's image.

This camera is designed to have acceptable resolution for a spatial frequency on the image plane of 68 lines per millimeter. What angular resolution does this correspond to for this camera's focal length? If you use this camera to take a picture of the Moon, what kind of detail could you resolve (the moon is half a degree).