Astr 5760_2019

Project # 1
Due Feb 14, 2019
Turn in a copy of your code, a written explanation you choices, and tables/graphs/images
of the requested results.

Write a ray trace code for producing spot diagrams from a simple cassegrain telescope.
Use a 1 meter f/3 primary and a confocal secondary to produce an f/15 system with the
on-axis focus 150 mm behind the primary vertex.

Provide the explicit form of the equations for the two mirrors.

Produce spot diagrams of targets at infinity in the focal plane perpendicular to the optic
axis and where on-axis light forms a perfect focus. Raytrace targets at the following off-
axis angles (in arc seconds) and present spot diagrams of the resulting blurs.

0
1
3
5
10
30
60
120
240
600
1200

What is the diameter of your secondary to provide complete capture of off axis light up to
5 arcminutes off axis?

Where would you place your focal plane to optimize for 30 arsecond field of view? For a
5 arcminute field of view? For a five arc minute field of view, allowing displacement,
and a spherically shaped detector, present an optimized choice for best net performance.

In the above cases, you must define a metric for optimal performance and then optimize
the system against that metric. State and defend your metric in the written portion of this
assignment.