

PHY-765 SS18: Gravitational Lensing. Worksheet Week 7

1 Short Essay on Gravitational Lensing - Continued

Continue working on the essay described in [exercise 2 on the worksheet from Week 6](#).

2 Comparing lens search examples with week 1 collections

Consider your reply to [the task 2.1 from Week 1](#).

2.1

Are these collections part of or related to the examples described in [this week's slides](#)?

2.2

Which surveys do these lenses stem from? Are these larger/smaller than the SDSS/DES/Gaia surveys introduced in the slides?

3 Exploring the core radius size's dependence on multiple images in the CIS

Using the lens equation for the CIS

$$\theta(\beta - \theta) = -\theta_0 \left[\sqrt{\theta^2 + \theta_{\text{core}}^2} - \theta_{\text{core}} \right]$$

plot β as a function of θ (both in units of θ_0) for a core radius of size $\theta_{\text{core}} = 0.1\theta_0$, $0.25\theta_0$ and $0.5\theta_0$. Flip the axes and determine the location where two new images appear for such lenses.