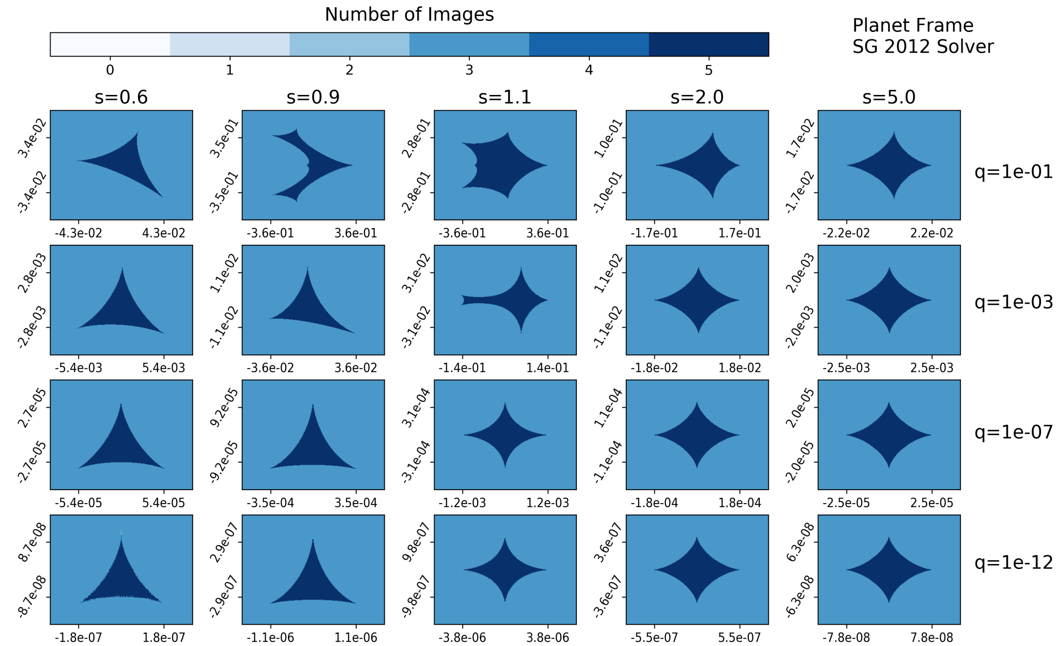


Figure 1: The number of images versus the position for varying parameters $q$ and $s$. All plots are accurate, with no errors, thus demonstrating the lower limit of what a typical computer can successfully calculate for binary lensing events.

This final simulation for the binary lens demonstrates a range of plots, which are all successful in modeling the number of images and magnification for the smallest possible mass ratios within the scope of my project. More specifically, the plots show the same grids for varying mass ratio, $q$, and separation, $s$, in the planet frame, using the Skowron and Gould 2012 root solver.

As of this point in the project, I have determined that doing calculations in the planet frame and using the Skowron and Gould 2012 root solver produces the least error-prone calculations. This final simulation for the binary lens demonstrates the most extreme values of the mass ratio, $q$, with typical values of separation, $s$, for which we can accurately model the number of images and the magnification. This simulation was therefore calculated in the planet frame, using the root solver in Skowron and Gould 2012. **Figure 1** shows the plot of the number of images, and **Figure 2** shows the plot of the magnification.

This simulation suggests that we can successfully model binary lensing events for mass ratios all the way down to $q = 10^{-12}$ for a wide range of separations between the host star and planet. This number drops to $10^{-15}$ for values of $s$ between 1.2 and 5. This is far more precise than modern technology will be able to detect, which suggests researchers do not need to rely on more precise and time-consuming algorithms than those mentioned in this project.

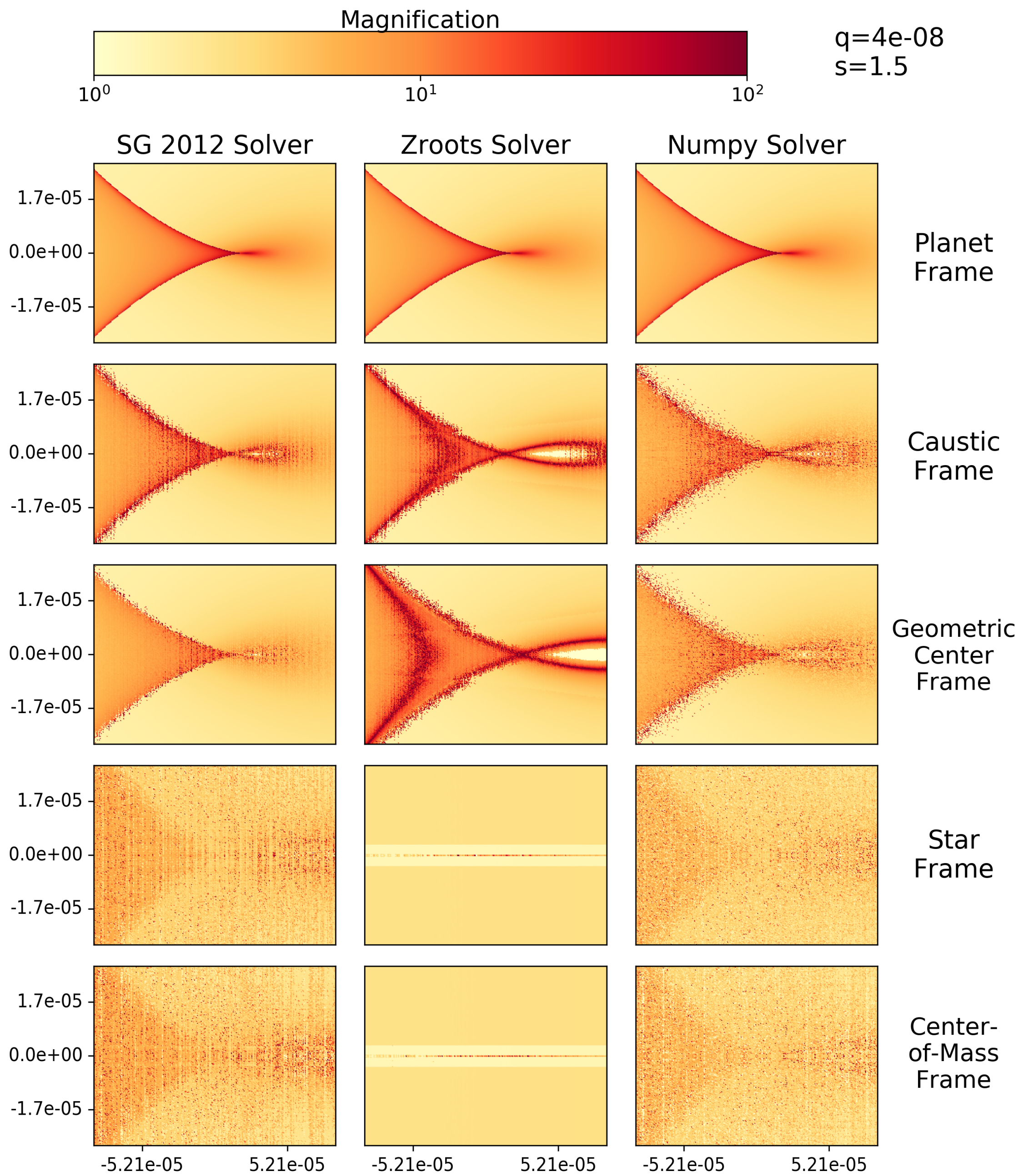


Figure 2: Same as **Figure 1**, except with magnification.