The next test determines how well the three solvers perform for varying coordinate systems, for constant parameters q and s. This test is done for the binary lens. Even though the solvers perform equally well in the planet frame, it is worth checking how well they perform in the other frames, as well. This will give us an idea of which solvers perform better in general; and thus, suggest which solver ought to be used in general microlensing computations. Again, the simulation plots the number of images and the magnification for a plot of points in the source plane. **Figure 1** shows the plot of the number of images, and **Figure 2** shows the plot of the magnification.

This simulation suggests that the Skowron and Gould 2012 root finder will generally provide the most reliable (i.e. least error-prone) calculations.

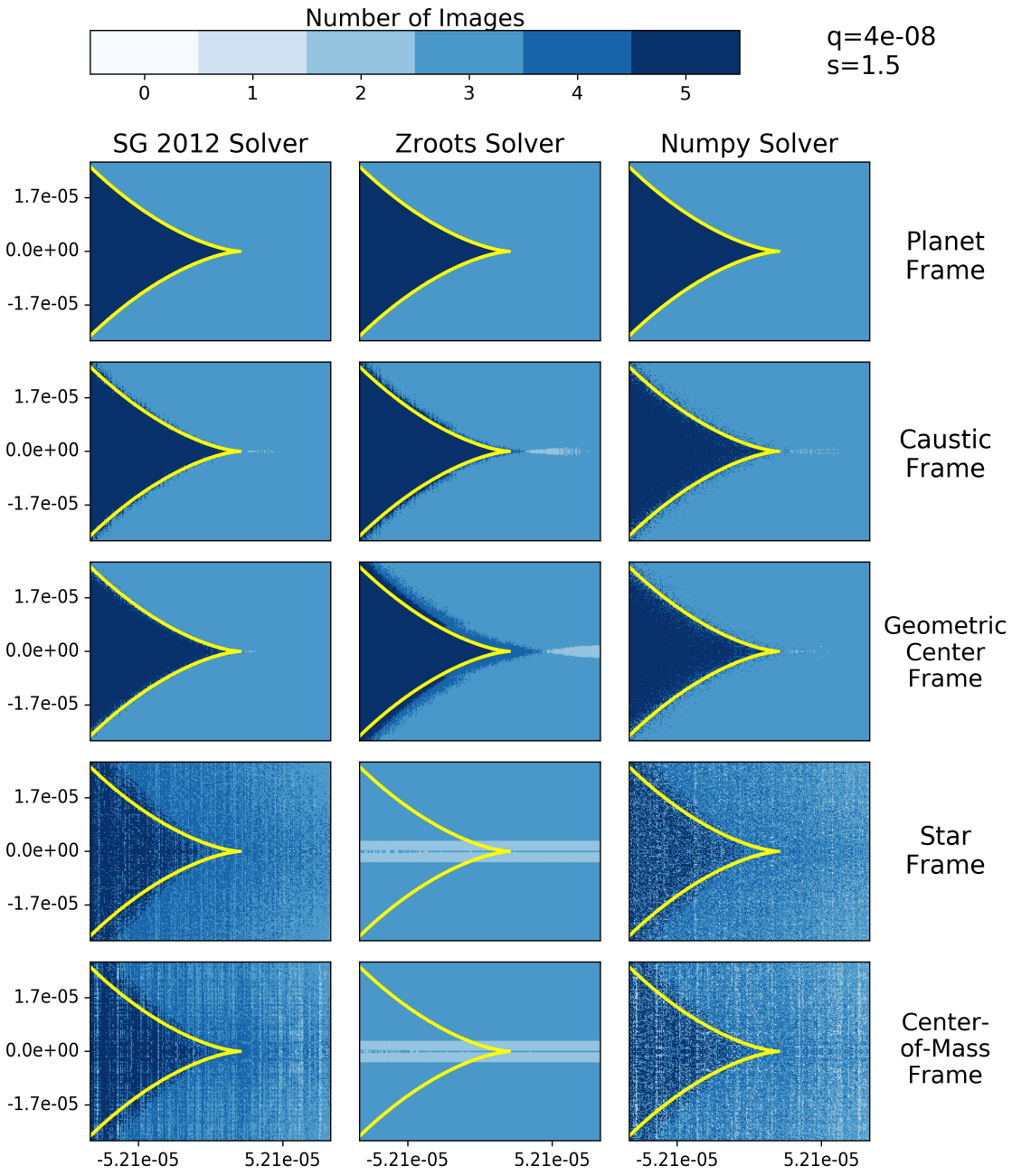

Figure 1: The number of images versus the position for each root solver for a given separation and mass ratio. The rows coorespond to different coordinate frames. All of the plots, except for those in planet frame, show errors since the mass ratio, q is near its lower limit for most frames. The planet frame plots, therefore, can be our comparison plots to show what we would expect for the given parameters s and q. In the rest of the frames, the Skowron and Gould root solver generally produces the least noise and number of errors. The plots fail completely for the center-of-mass and star frames.

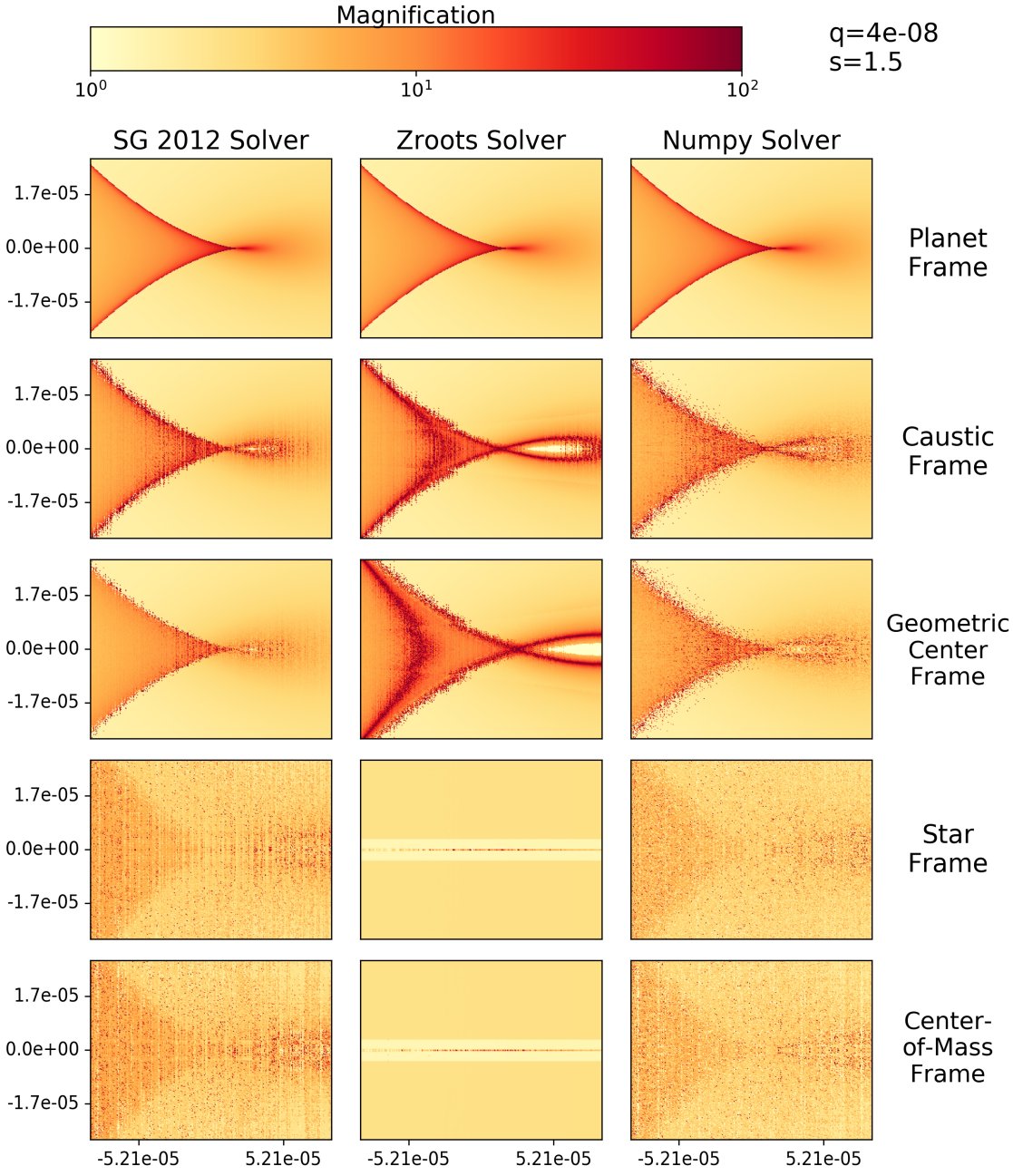

Figure 2: Same as **Figure 1**, except with magnification.