THE MICROLENSING EVENTS IN Q2237+0305A: NO CASE AGAINST SMALL MASSES/LARGE SOURCES

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1. Introduction

Witt & Mao (1994) claim that the data reported by Racine (1992) contains "a quite well sampled M-shaped double event in image A of 0.3 and 0.4 mag, respectively". They further state that the very low average mass scenario put forward by Refsdal & Stabell (1991) does not predict "well-resolved *asymmetric* events, as have been observed in image A".

The first peak has only six sampling points, with all but one point clustered on one side of the peak. The second peak has 5 sampling points, with *all* points clustered on one side of the peak. The degree of asymmetry is thus very hard to quantify.

2. The Large Source Model

I have studied a large number of large source light curves Haugan (1994) produced with the rayshooting method. A Gaussian source profile $I(\boldsymbol{y}) \propto \exp(-|\boldsymbol{y}|^2/r_s^2)$ was used, where $\boldsymbol{y}$ is the dimensionless position relative to the source center, and r_s is the dimensionless source size.

Large source models do not typically produce asymmetric events, but they certainly do occur. In order to highlight the problems of using isolated events in order to determine the normalized source size, Fig. 1 shows a curve similar to the one appearing in Racine (1992) superposed on simulated light curves with large sources. The light curve parameters κ_*, γ, and r_s, are indicated. Positive γ indicates that the large, elongated caustic structures

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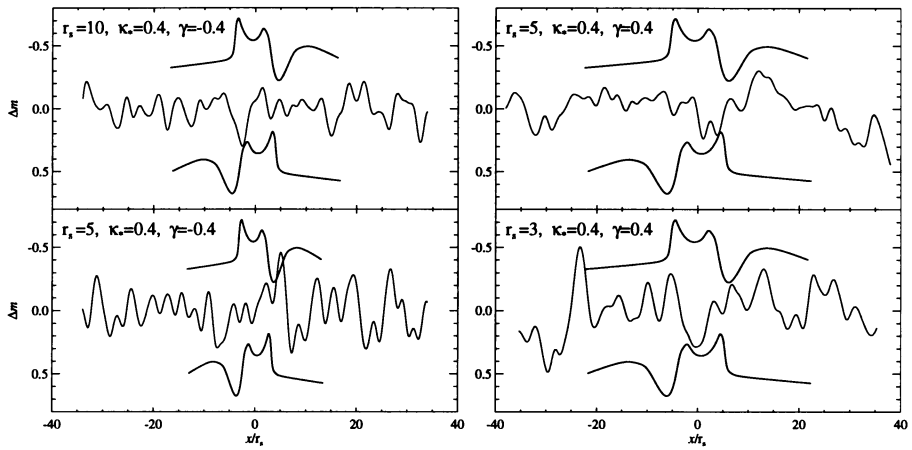

Figure 1. Light curves from simulations with a curve similar to the one in Racine (1992) superimposed. Abscissa values are in units of the source size r_s.

are oriented along the source track. A time-reversed version of the spline curve is also supplied to aid the eye.

Although searching for exact replicas of the observed light curve among simulated light curves is useless, a comparison by eye can easily be done. Although light curves with large sources lack the clear M-shaped events of light curves with small sources ($r_s \ll 1$), the peaks may very well be asymmetric to the extent indicated by the observations.

3. Conclusion

Based on the above arguments, the exclusion of models with a large source or low average masses is *not* justified from the 1988-90 events. Further observations and analysis should therefore not be concentrated solely on interpreting the light curves from the perspective of (very) small sources.

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