Distribution of Caustic-crossing Intervals for Galactic Binary-lens Microlensing Events

Seong-Hong Park, Cheongho Han & Yong-Sam Lee

Department of Astronomy & Space Science, Chungbuk National University

Detection of caustic crossing of binary-lens gravitational microlensing events is important because by detecting them one can obtain useful information about both the lens and the source star. In this paper, we compute the distribution of intervals between two successive caustic crossing, $f(t_{cc})$, for Galactic bulge binary-lens events to investigate the observational strategy for the optimal detection and resolution of caustic crossings. From this computation, we find that the distribution is highly skewed towards short t_{cc} and peaks at $t_{cc} \sim 1.5$d. For the maximal detection of caustic crossings, therefore, prompt initiation of follow-up observations for intensive monitoring of events will be important. We estimate that, under the strategy of the current follow-up observations with a second caustic-crossing preparation time of ~2d, the fraction of events with resolvable caustic crossing is ~ 80 per cent. We find that if the follow-up observations can be initiated within 1d after the first caustic crossing by adopting more aggressive observational strategies, the detection rate can be improved to ~ 90 per cent.