Microlensing: State of the Field

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Microlensing Has Found Approximately…

a) 30 planets

b) 65 planets

c) 100 planets
Data (mostly) from the Exoplanet Archive as of 10/27/20
Data (mostly) from the Exoplanet Archive as of 10/27/20
FFPs: shorter timescale smaller mass

\[ M_L = \frac{\theta_E^2}{\kappa \pi_{rel}} = \frac{(t_E/\mu_{rel})^2}{\kappa \pi_{rel}} \]
FFPs: $\theta_E$ is better than $t_E$

$$M_L = \frac{\theta_E^2}{\kappa\pi_{\text{rel}}} = \frac{(t_E/\mu_{\text{rel}})^2}{\kappa\pi_{\text{rel}}}$$
$t_E = 41 \text{ min}!$

$t_E = 7.7 \text{h}$

$OELE /$
KMT CTIO /$
KMT CTIO V$
KMT SAAO /$

$E = 6.5 \text{h}$

$OELE-2012-BLG-1323$

$OELE-2019-BLG-0551$

$E = 9 \text{h}$

$OELE /$
KMT SSO$
KMT SAAO$
KMT CTIO$

$E = 3.7 \text{h}$

$OELE-2012-BLG-1323$

$OELE-2019-BLG-0551$

$E = 6.5 \text{h}$

Mroz et al. 2018, AJ, 155, 121
Mroz et al. 2019, A&A 622, 201
Mroz et al. 2020 AJ, 159, 282
Data (mostly) from the Exoplanet Archive as of 10/27/20
Data (mostly) from the Exoplanet Archive as of 10/27/20
No Clear Detection of Host (=Lens) in Seeing-Limited Images

= Source + Lens
+ Companion to Source?
+ Companion to Lens?
+ Unrelated Star(s)?

Shan, Yee et al. 2020, in prep
No Clear Detection of Host (=Lens) in Seeing-Limited Images

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Shan, Yee et al. 2020, in prep
AO of OB05169: Separation is Better

Lens (+ Comp?)

Source

\[ \mu_{rel} = \frac{\theta_E}{r_E} \]

Batista et al. 2015 ApJ 808, 170
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Microlens Parallax \((\pi_E)\) Constrains Mass and Distance

\[
M_L = \frac{\theta_E}{\kappa \pi_E}
\]

\[
D_L = \left(\theta_E \pi_E + \frac{1}{D_S}\right)^{-1}
\]