

Microensing parameters in `MulensModel` class `ModelParameters`:

Parameter	Name in <code>MulensModel</code>	Unit	Description
t_0	<code>t_0</code>		The time of the closest approach between the source and the lens.
u_0	<code>u_0</code>		The impact parameter between the source and the lens center of mass.
t_E	<code>t_E</code>	d	The Einstein crossing time.
t_{eff}	<code>t_eff</code>	d	The effective timescale, $t_{\text{eff}} \equiv u_0 t_E$.
ρ	<code>rho</code>		The radius of the source as a fraction of the Einstein ring.
t_\star	<code>t_star</code>	d	The source self-crossing time, $t_\star \equiv \rho t_E$.
$\pi_{E,N}$	<code>pi_E_N</code>		The North component of the microensing parallax vector.
$\pi_{E,E}$	<code>pi_E_E</code>		The East component of the microensing parallax vector.
$t_{0,\text{par}}$	<code>t_0_par</code>		The reference time for parameters in parallax models. ^a
s	<code>s</code>		The projected separation between the lens primary and its companion as a fraction of the Einstein ring radius.
q	<code>q</code>		The mass ratio between the lens companion and the lens primary $q \equiv m_2/m_1$.
α	<code>alpha</code>	deg.	The angle between the source trajectory and the binary axis.
ds/dt	<code>ds_dt</code>	yr ⁻¹	The rate of change of the separation.
$d\alpha/dt$	<code>dalpha_dt</code>	deg. yr ⁻¹	The rate of change of α .
$t_{0,\text{kep}}$	<code>t_0_kep</code>		The reference time for lens orbital motion calculations. ^a
$x_{\text{caustic,in}}$	<code>x_caustic_in</code>		Curvilinear coordinate of caustic entrance for a binary lens model. ^b
$x_{\text{caustic,out}}$	<code>x_caustic_out</code>		Curvilinear coordinate of caustic exit for a binary lens model. ^b
$t_{\text{caustic,in}}$	<code>t_caustic_in</code>		Epoch of caustic exit for a binary lens model. ^b
$t_{\text{caustic,out}}$	<code>t_caustic_out</code>		Epoch of caustic exit for a binary lens model. ^b

Table 1: Notes:

^a – $t_{0,\text{par}}$ and $t_{0,\text{kep}}$ are reference parameters, hence, do not change these during fitting.

^b – The four parameters of binary lens in Cassan (2008) parameterization ($x_{\text{caustic,in}}$, $x_{\text{caustic,out}}$, $t_{\text{caustic,in}}$, and $t_{\text{caustic,out}}$) are used instead of (t_0 , u_0 , t_E , and α).

Some of the parameters can be defined separately for each of the sources in binary source models. In that case, add `_1` or `_2` to parameter name. These are:

- `t_0_1`, `t_0_2`,
- `u_0_1`, `u_0_2`,
- `rho_1`, `rho_2`,
- `t_star_1`, `t_star_2`.

Also note that there are properties of the microlensing events that are not considered parameters in the `ModelParameters` class, but are implemented in other parts of the `MulensModel`. The most important are:

- source and blending fluxes – `Event` and `FitData`; also see use case 38,
- sky coordinates – `Model.coords`,
- limb-darkening coefficients – `Model.set_limb_coeff_gamma` and `Model.set_limb_coeff_u`,
- flux ratio for binary source models – `Model.set_source_flux_ratio` and `Model.set_source_flux_ratio_for_band`,
- methods used to calculate magnification – `Model.set_magnification_methods`,
- coordinates of space telescopes – `Model.get_satellite_coords`.