

Magnification Calculation for Binary Lens

Define equation for magnification by assigning the equations: partial zeta with respect to conjugate of z, and the determinant of the Jacobian.

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dzeta = (m - dm) / ((Conjugate[z1] - Conjugate[z]) ^ 2) + (m + dm) / ((Conjugate[z2] - Conjugate[z]) ^ 2)  
detJ = Refine[Simplify[1 - dzeta * Conjugate[dzeta]], {z1, z2, m, dm} ∈ Reals]
```

$$\frac{-dm + m}{(-\text{Conjugate}[z] + \text{Conjugate}[z1])^2} + \frac{dm + m}{(-\text{Conjugate}[z] + \text{Conjugate}[z2])^2}$$

$$1 - \left(\frac{-dm + m}{(z - z1)^2} + \frac{dm + m}{(z - z2)^2} \right) \left(\frac{-dm + m}{(-z1 + \text{Conjugate}[z])^2} + \frac{dm + m}{(-z2 + \text{Conjugate}[z])^2} \right)$$

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magnification = 1 / detJ
```

$$\frac{1}{1 - \left(\frac{-dm+m}{(z-z1)^2} + \frac{dm+m}{(z-z2)^2} \right) \left(\frac{-dm+m}{(-z1+\text{Conjugate}[z])^2} + \frac{dm+m}{(-z2+\text{Conjugate}[z])^2} \right)}$$