

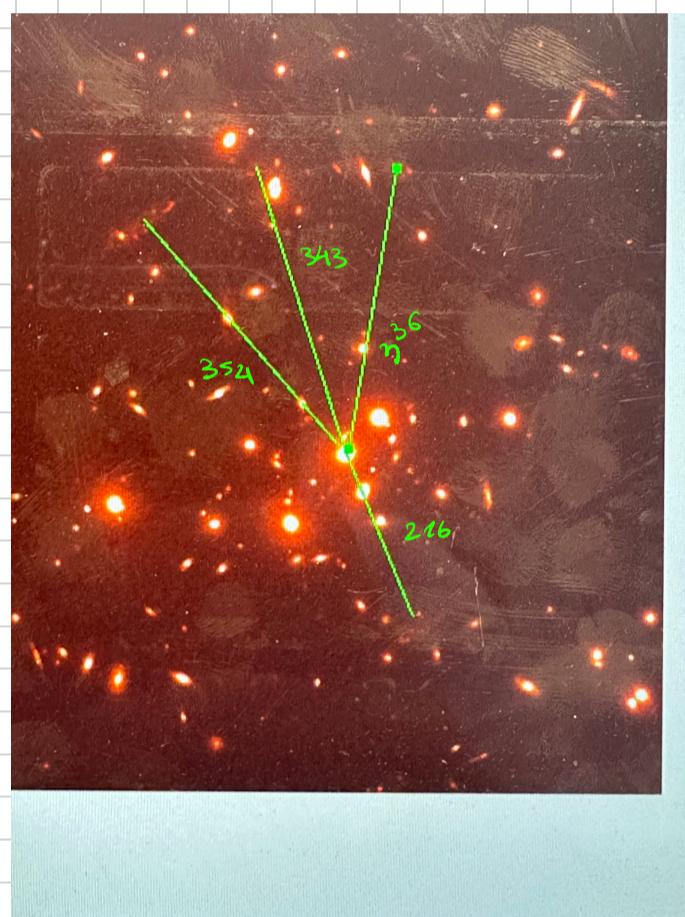
P1 | (2.8a.)  $D_A : -r_{ds} = 0$  für  $z_s = z_d \Rightarrow$  erklärt Nullstellen + neg. Bereich macht kein Sinn  
 - Peak strength  $\sim \frac{1}{n}$  und  $n$  größer in rem neg. Universum

P3 | 3 oben: (1262, 717); (1101, 715); (281, 653)

1 unten: Image coordinates:  $(X, Y) = (1302, 1206)$

Für 5<sup>th</sup> Bild Farbbild vom Cluster suchen

P4 | O (weil von oben  
schaen ausm HST  
aus)



Found the 5<sup>th</sup> image

in color image!

image coordinates: (1191, 349).

$$\Delta BD = 562 \text{ px}$$

$$= 562 \cdot 0.1''$$

$$= 5.62''$$

$$\Rightarrow \theta_E \approx 2.8''$$

$$\Rightarrow \sigma = \frac{\theta_E}{4\pi \left(\frac{c}{c}\right)^2 \frac{D_{ds}(z_{source}, z_{source})}{D_s(0, z_{source})}}$$

$\boxed{z=0.4}$        $\boxed{\Omega=1, \Lambda=0}$   
 $\downarrow$                    $\sqrt{1.6 \text{ oder } \infty}$

$$\sqrt{\frac{c^2}{4\pi} \theta_E \frac{D_s}{D_{ds}}} = \sigma$$

P6 | ??

P7 | Scale adjust bis nur 1 Pixel sichtbar

$$X = (1205.835, 388.050)$$

bzw. nach oben:  $388.532 = Y_+$

nach unten:  $387.568 = Y_-$

nach rechts:  $1206.799 = X_+$

nach links:  $1205.333 = X_-$

P8 | 3 Objekte in einem Bloß

T12 |  $x, y, \phi, S, \epsilon_0, \epsilon \Rightarrow 3$  Bilder

P6 |  $x_c^{\text{upper-limit}} = 0.05$  eher  $x_c \approx 0.05 \dots$

P9] We set the the coords of G1 and G2 to those by the Sextractor

$$G_1 \quad y_{\min} = 680.619 \quad y_{\max} = 701.355$$

$$G_1 \quad x_{\min} = 1114.462 \quad x_{\max} = 1128.978$$

$$G_2 \quad y_{\min} = 738.680 \quad y_{\max} = 753.195$$

$$G_2 \quad x_{\min} = 1060.549 \quad x_{\max} = 1075.064$$

```

!!!!!! for the modelled mass distributions !!!!!!!
free parameters
!
!           G1, G2, CL
DATA cmass_name /'01', '01', '01' / ! do not change
DATA Ntake_mass / 1, 1, 1/ ! 1 or 0
DATA Ntype_mass / 1, 1, 3/ ! 1 for sis
DATA Nvary_ce1 / 0, 0, 0/ ! change this for P14
DATA Nvary_ce2 / 0, 0, 0/ ! do not change

!!!!!! for the modelled mass distributions !!!!!!!
free parameters
!
!           G1, G2, CL
DATA cmass_name /'01', '01', '01' / ! do not change
DATA Ntake_mass / 0, 0, 1/ ! 1 or 0
DATA Ntype_mass / 1, 1, 3/ ! 1 for sis, 2 for sis+core, 3 for ellip
DATA Nvary_ce1 / 0, 0, 0/ ! change this for P14
DATA Nvary_ce2 / 0, 0, 0/ ! do not change

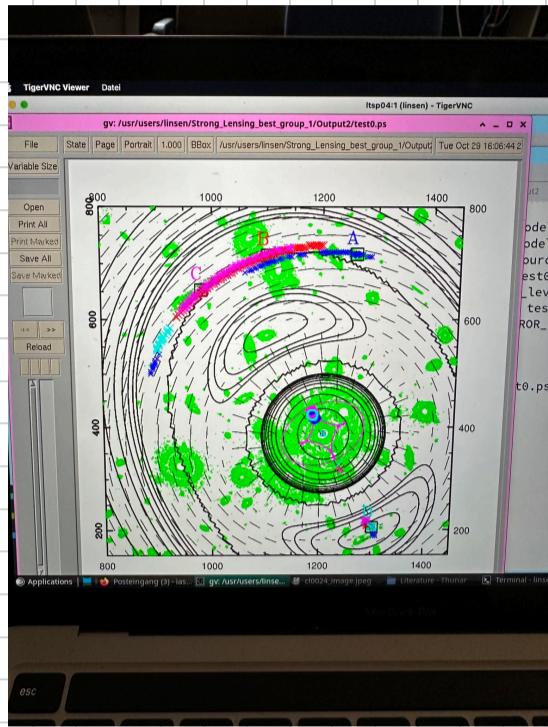
starting values and min/max values

```

```

1,2

```



```

1,2

```

$\Rightarrow$  zwei Bilder.

① wo setzen wir finale Positionen?

P10]

```

!!!!!! for the modelled mass distributions !!!!!!!
free parameters
!
```

```

for ii.) 180 - 200 - 220
sigma_min
for

```

P11] even parity: C and A  
/even

B odd parity

↳ außerhalb  
oder  
innerhalb  
krit. curve  
abhängig von

Galaxienmassen  $G_1, G_2$   
ob die mit dabei sind

D ist odd

E ist even; wenn man von außen nach innen geht...

P12

Beide Galaxie

```
!!!!!! for the modelled mass distributions !!!!!!
free parameters
!
! DATA cmass_name / G1, G2, CL
DATA Ntakce_mass / 1., 1., 1/ ! 1 or 0
DATA Nttype_mass / 1, 1, 3/ ! 1 for sis, 2 for sis+core
DATA Nvary_ce1 / 0, 0, 0/ ! change this for P14
DATA Nvary_ce2 / 0, 0, 0/
!
DATA Nvary_sig / 1, 1, 1/
DATA Nvary_eps / 0, 0, 0/
DATA Nvary_phi / 0, 0, 1/
DATA Ntufi / 0, 0, 0/ ! do not change

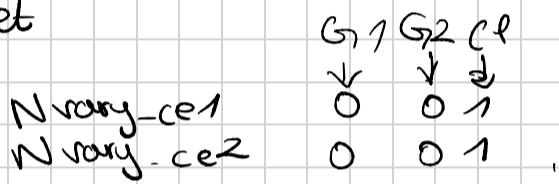
starting values and min/max values
!
DATA cel1 / 1122.1 , 1067.8, 1205.835/
-- INSERT --
```

```
File Edit View Terminal Tabs Help
prak3.inf + (~Strong_Lensing.best_group_1)-VIM
prak3.inf + (~Strong_Lensing.best_group_1)-VIM
G1 G2 CL
!
DATA cel1 / 1122.1 , 1067.8, 1205.835/
DATA cel1_min/1114.462, 1060.549, 1205.353/
DATA cel1_max/1128.978, 1075.064, 1206.799/
!
DATA ce2 / 699.3, 746.3, 388.050/
DATA ce2_min/ 680.619, 738.680, 387.568/
DATA ce2_max/ 701.355, 753.195, 388.532/
!
DATA sig / 120., 120., 1300./
DATA sig_min/ 100., 100., 500./
DATA sig_max/ 300., 300., 1500./
!
DATA cor / 1., 1., 30./
DATA cor_min/ .1, .1, 1./
DATA cor_max/ 10., 10., 200./
!
DATA (eps(j),j=1,nmass) /nmass * 0.05/
DATA (eps_min(j),j=1,nmass) /nmass * 0.02/
DATA (eps_max(j),j=1,nmass) /nmass * 0.2 /
!
DATA (phi(j),j=1,nmass) /nmass * 60.0/
DATA (phi_min(j),j=1,nmass) /nmass * -90.0/
DATA (phi_max(j),j=1,nmass) /nmass * 90.0 /
!
```

4 Images, 5 Images

P13a) E is in der Mitte, wo elliptisches Potential  
schlechte Approx. zu den 3 runden Körpern.  
draußen passt es wieder,

P13b) we set



5 images.

und i.) diese Grenzen:

das von  
sobisso

nochmal so:  
⇒ ii.)

```
File Edit View Terminal Tabs Help
prak3.inf + (~Strong_Lensing.best_group_1)-VIM
!
starting values and min/max values
!
! G1 G2 CL
DATA cel1 / 1122.1 , 1067.8, 1205.835/
DATA cel1_min/1114.462, 1060.549, 1205.353/
DATA cel1_max/1128.978, 1075.064, 1206.799/
!
DATA ce2 / 699.3, 746.3, 388.050/
DATA ce2_min/ 680.619, 738.680, 387.568/
DATA ce2_max/ 701.355, 753.195, 388.532/
!
DATA sig / 120., 120., 1300./
DATA sig_min/ 100., 100., 500./
DATA sig_max/ 300., 300., 1500./
!
DATA cor / 1., 1., 30./
DATA cor_min/ .1, .1, 1./
DATA cor_max/ 10., 10., 200./
!
DATA (eps(j),j=1,nmass) /nmass * 0.05/
DATA (eps_min(j),j=1,nmass) /nmass * 0.02/
DATA (eps_max(j),j=1,nmass) /nmass * 0.2 /
!
DATA (phi(j),j=1,nmass) /nmass * 60.0/
DATA (phi_min(j),j=1,nmass) /nmass * -90.0/
DATA (phi_max(j),j=1,nmass) /nmass * 90.0 /
!
```

```
File Edit View Terminal Tabs Help
prak3.inf + (~Strong_Lensing.best_group_1)-VIM
!
starting values and min/max values
!
! G1 G2 CL
DATA cel1 / 1122.1 , 1067.8, 1205.835/
DATA cel1_min/1114.462, 1060.549, 1205.353/
DATA cel1_max/1128.978, 1075.064, 1206.799/
!
DATA ce2 / 699.3, 746.3, 388.050/
DATA ce2_min/ 680.619, 738.680, 387.568/
DATA ce2_max/ 701.355, 753.195, 388.532/
!
DATA sig / 120., 120., 1300./
DATA sig_min/ 100., 100., 500./
DATA sig_max/ 300., 300., 1500./
!
DATA cor / 1., 1., 30./
DATA cor_min/ .1, .1, 1./
DATA cor_max/ 10., 10., 200./
!
DATA (eps(j),j=1,nmass) /nmass * 0.05/
DATA (eps_min(j),j=1,nmass) /nmass * 0.02/
DATA (eps_max(j),j=1,nmass) /nmass * 0.2 /
!
DATA (phi(j),j=1,nmass) /nmass * 60.0/

```

iii.)

mit anderen  
D Koordinaten

```
File Edit View Terminal Tabs Help
prak3.inf + (~Strong_Lensing.best_group_1)-VIM
DATA Ntufi / 0, 0, 0/ ! do not change

starting values and min/max values
!
G1 G2 CL
DATA cel1 / 1122.1 , 1067.8, 1205.835/
DATA cel1_min/1114.462, 1060.549, 1155.353/
DATA cel1_max/1128.978, 1075.064, 1256.799/
!
DATA ce2 / 699.3, 746.3, 388.050/
DATA ce2_min/ 680.619, 738.680, 437.568/
DATA ce2_max/ 701.355, 753.195, 338.532/
!
DATA sig / 120., 120., 1300./
DATA sig_min/ 100., 100., 500./
DATA sig_max/ 300., 300., 1500./
!
DATA cor / 1., 1., 30./
DATA cor_min/ .1, .1, 1./
DATA cor_max/ 10., 10., 200./
!
DATA (eps(j),j=1,nmass) /nmass * 0.05/
DATA (eps_min(j),j=1,nmass) /nmass * 0.02/
DATA (eps_max(j),j=1,nmass) /nmass * 0.2 /
!
DATA (phi(j),j=1,nmass) /nmass * 60.0/

```

v.)

```
File Edit View Terminal Tabs Help
prak3.inf + (~Strong_Lensing.best_group_1)-VIM
DATA Ntufi / 0, 0, 0/ ! do not change

starting values and min/max values
!
G1 G2 CL
DATA cel1 / 1122.1 , 1067.8, 1205.835/
DATA cel1_min/1114.462, 1060.549, 1155.353/
DATA cel1_max/1128.978, 1075.064, 1215.799/
!
DATA ce2 / 699.3, 746.3, 388.050/
DATA ce2_min/ 680.619, 738.680, 398.568/
DATA ce2_max/ 701.355, 753.195, 398.532/
!
DATA sig / 120., 120., 1300./
DATA sig_min/ 100., 100., 500./
DATA sig_max/ 300., 300., 1500./
!
DATA cor / 1., 1., 30./
DATA cor_min/ .1, .1, 1./
DATA cor_max/ 10., 10., 200./
!
DATA (eps(j),j=1,nmass) /nmass * 0.05/
DATA (eps_min(j),j=1,nmass) /nmass * 0.02/
DATA (eps_max(j),j=1,nmass) /nmass * 0.2 /
!
DATA (phi(j),j=1,nmass) /nmass * 60.0/

```

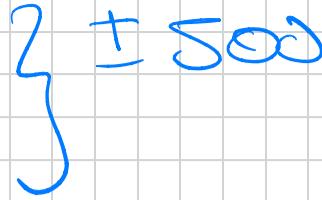
vi.) 2

Vii)

jetzt nochmal aber positionen der Arcs nehmen.

Also:

E (faint Mitte) : (1190, 347) zeigt nach links unten die Arc

 + 500

D (unten) : (1274, 175) nach l.u.

A (rechts oben) : (1276, 715) nach r.o.

C (links oben) : (1003, 669) nach r.o.

B (Mitte oben) : (1091, 708) nach l.unten.

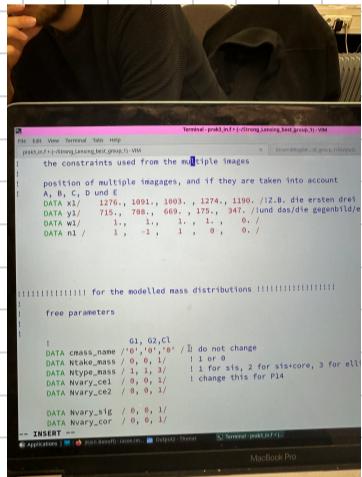
viii) 

  diese constraints!

of cluster-lens  
from fit

$$x_{true}, y_{true} = 1184.19, 361.2$$

P13c)



```
the constraints used from the multiple images
position of multiple imagages, and if they are taken into account
A, B, C, D und E
DATA xi1/ 1276., 1091., 1003., 1274., 1190. /IZ.B. die ersten drei
DATA yi1/ 715., 708., 669., 175., 347. /und das/die gegenüberliegenden
DATA wi1/ 1., 1., 1., 1., 1. /
DATA ni1/ 1., -1., 1., 0., 0. /
```

for the modelled mass distributions !!!!!!!

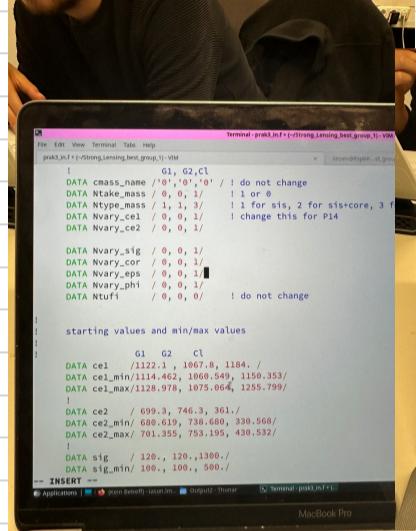
free parameters

```
G1 G2 Cl
DATA cmass_name /'0','0','0'/; do not change
DATA Ntke_mass / 0, 0, 1/; 1 or 0
DATA Ntype_mass / 1, 1, 3/; 1 for sis, 2 for sis+core, 3 for ellip
DATA Nvary_ce1 / 0, 0, 1/; 1 for sis, 2 for sis+core, 3 for ellip
DATA Nvary_ce2 / 0, 0, 1/; change this for P14
```

starting values and min/max values

```
G1 G2 Cl
DATA cel /1122.1 , 1067.8, 1205.835/
DATA cel_min/1114.462, 1060.549, 1150.353/
DATA cel_max/1128.978, 1075.064, 1255.799/
!
DATA ce2 / 699.3, 746.3, 388.050/
DATA ce2_min/ 680.619, 738.680, 330.568/
DATA ce2_max/ 701.355, 753.195, 430.532/
!
DATA sig / 120., 120., 1300./
DATA sig_min/ 100., 100., 500./
DATA sig_max/ 300., 300., 1500./
!
DATA cor / 1., 1., 30./
DATA cor_min/ .1, .1, 1./
DATA cor_max/ 10., 10., 200./
!
DATA (eps(j),j=1,nmass) /nmass * 0.05/
DATA (eps_min(j),j=1,nmass) /nmass * 0.02/
DATA (eps_max(j),j=1,nmass) /nmass * 0.2 /
!
DATA (phi(j),j=1,nmass) /nmass * 60.0/
DATA (phi_min(j),j=1,nmass) /nmass * -90.0/
DATA (phi_max(j),j=1,nmass) /nmass * 90.0 /
!
```

-- INSERT --



```
the constraints used from the multiple images
position of multiple imagages, and if they are taken into account
A, B, C, D und E
DATA xi1/ 1276., 1091., 1003., 1274., 1190. /IZ.B. die ersten drei
DATA yi1/ 715., 708., 669., 175., 347. /und das/die gegenüberliegenden
DATA wi1/ 1., 1., 1., 1., 1. /
DATA ni1/ 1., -1., 1., 0., 0. /
```

for the modelled mass distributions !!!!!!!

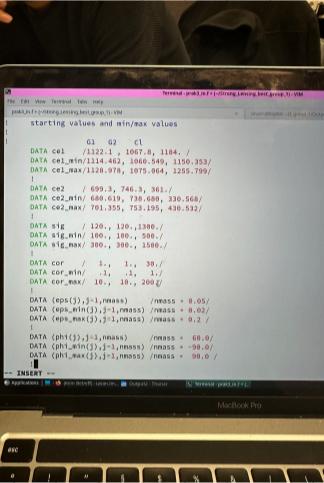
free parameters

```
G1 G2 Cl
DATA cmass_name /'0','0','0'/; do not change
DATA Ntke_mass / 0, 0, 1/; 1 or 0
DATA Ntype_mass / 1, 1, 3/; 1 for sis, 2 for sis+core, 3 for ellip
DATA Nvary_ce1 / 0, 0, 1/; 1 for sis, 2 for sis+core, 3 for ellip
DATA Nvary_ce2 / 0, 0, 1/; change this for P14
```

starting values and min/max values

```
G1 G2 Cl
DATA cel /1122.1 , 1067.8, 1184. /
DATA cel_min/1114.462, 1060.549, 1150.353/
DATA cel_max/1128.978, 1075.064, 1255.799/
!
DATA ce2 / 699.3, 746.3, 361. /
DATA ce2_min/ 680.619, 738.680, 330.568/
DATA ce2_max/ 701.355, 753.195, 430.532/
!
DATA sig / 120., 120., 1300. /
DATA sig_min/ 100., 100., 500. /
DATA sig_max/ 300., 300., 1500. /
!
DATA cor / 1., 1., 30. /
DATA cor_min/ .1, .1, 1. /
DATA cor_max/ 10., 10., 200. /
!
DATA (eps(j),j=1,nmass) /nmass * 0.05 /
DATA (eps_min(j),j=1,nmass) /nmass * 0.02 /
DATA (eps_max(j),j=1,nmass) /nmass * 0.2 /
!
DATA (phi(j),j=1,nmass) /nmass * 60.0 /
DATA (phi_min(j),j=1,nmass) /nmass * -90.0 /
DATA (phi_max(j),j=1,nmass) /nmass * 90.0 /
!
```

-- INSERT --



```
the constraints used from the multiple images
position of multiple imagages, and if they are taken into account
A, B, C, D und E
DATA xi1/ 1276., 1091., 1003., 1274., 1190. /IZ.B. die ersten drei
DATA yi1/ 715., 708., 669., 175., 347. /und das/die gegenüberliegenden
DATA wi1/ 1., 1., 1., 1., 1. /
DATA ni1/ 1., -1., 1., 0., 0. /
```

for the modelled mass distributions !!!!!!!

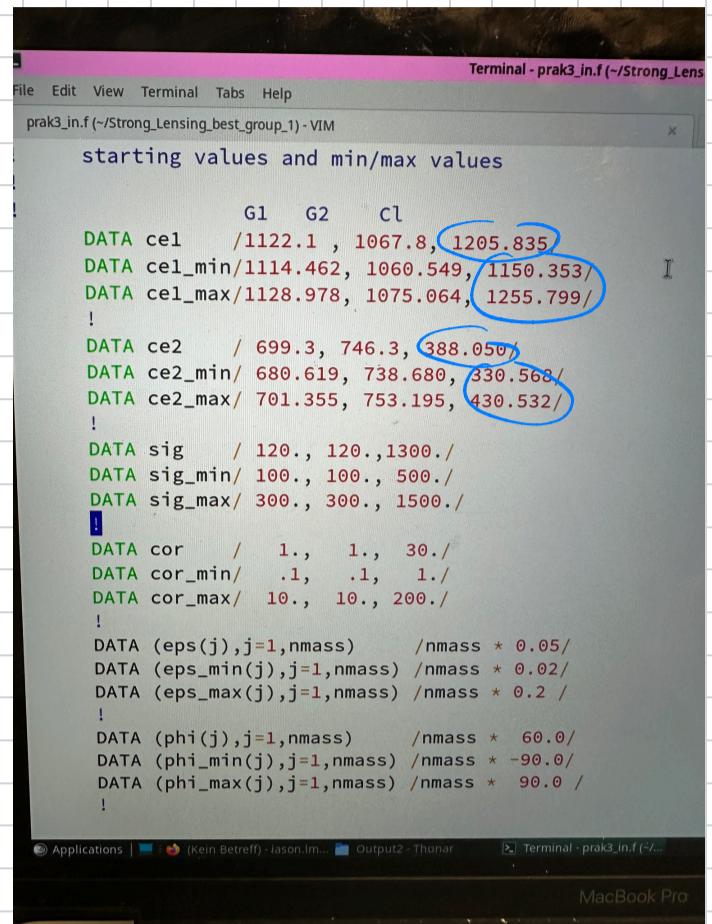
free parameters

```
G1 G2 Cl
DATA cmass_name /'0','0','0'/; do not change
DATA Ntke_mass / 0, 0, 1/; 1 or 0
DATA Ntype_mass / 1, 1, 3/; 1 for sis, 2 for sis+core, 3 for ellip
DATA Nvary_ce1 / 0, 0, 1/; 1 for sis, 2 for sis+core, 3 for ellip
DATA Nvary_ce2 / 0, 0, 1/; change this for P14
```

starting values and min/max values

```
G1 G2 Cl
DATA cel /1122.1 , 1067.8, 1184. /
DATA cel_min/1114.462, 1060.549, 1150.353/
DATA cel_max/1128.978, 1075.064, 1255.799/
!
DATA ce2 / 699.3, 746.3, 361. /
DATA ce2_min/ 680.619, 738.680, 330.568/
DATA ce2_max/ 701.355, 753.195, 430.532/
!
DATA sig / 120., 120., 1300. /
DATA sig_min/ 100., 100., 500. /
DATA sig_max/ 300., 300., 1500. /
!
DATA cor / 1., 1., 30. /
DATA cor_min/ .1, .1, 1. /
DATA cor_max/ 10., 10., 200. /
!
DATA (eps(j),j=1,nmass) /nmass * 0.05 /
DATA (eps_min(j),j=1,nmass) /nmass * 0.02 /
DATA (eps_max(j),j=1,nmass) /nmass * 0.2 /
!
DATA (phi(j),j=1,nmass) /nmass * 60.0 /
DATA (phi_min(j),j=1,nmass) /nmass * -90.0 /
DATA (phi_max(j),j=1,nmass) /nmass * 90.0 /
!
```

-- INSERT --



```
starting values and min/max values
G1 G2 Cl
DATA cel /1122.1 , 1067.8, 1205.835/
DATA cel_min/1114.462, 1060.549, 1150.353/
DATA cel_max/1128.978, 1075.064, 1255.799/
!
DATA ce2 / 699.3, 746.3, 388.050/
DATA ce2_min/ 680.619, 738.680, 330.568/
DATA ce2_max/ 701.355, 753.195, 430.532/
!
DATA sig / 120., 120., 1300. /
DATA sig_min/ 100., 100., 500. /
DATA sig_max/ 300., 300., 1500. /
!
DATA cor / 1., 1., 30. /
DATA cor_min/ .1, .1, 1. /
DATA cor_max/ 10., 10., 200. /
!
DATA (eps(j),j=1,nmass) /nmass * 0.05 /
DATA (eps_min(j),j=1,nmass) /nmass * 0.02 /
DATA (eps_max(j),j=1,nmass) /nmass * 0.2 /
!
DATA (phi(j),j=1,nmass) /nmass * 60.0 /
DATA (phi_min(j),j=1,nmass) /nmass * -90.0 /
DATA (phi_max(j),j=1,nmass) /nmass * 90.0 /
!
```

P13d)

i.) einmal mit  $350 = \text{cor\_max}$

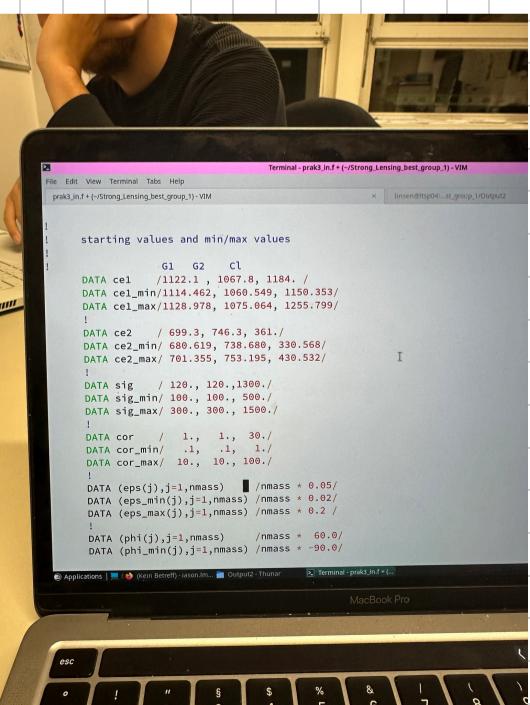
ii.) -+ mit  $100 = \text{cor\_max}$

P13e)

i.) einmal mit  $100 = \text{cor\_max}$

ii.) -" mit  $350 = \text{cor\_max}$

für i.):



```
the constraints used from the multiple images
position of multiple imagages, and if they are taken into account
A, B, C, D und E
DATA xi1/ 1276., 1091., 1003., 1274., 1190. /IZ.B. die ersten drei
DATA yi1/ 715., 708., 669., 175., 347. /und das/die gegenüberliegenden
DATA wi1/ 1., 1., 1., 1., 1. /
DATA ni1/ 1., -1., 1., 0., 0. /
```

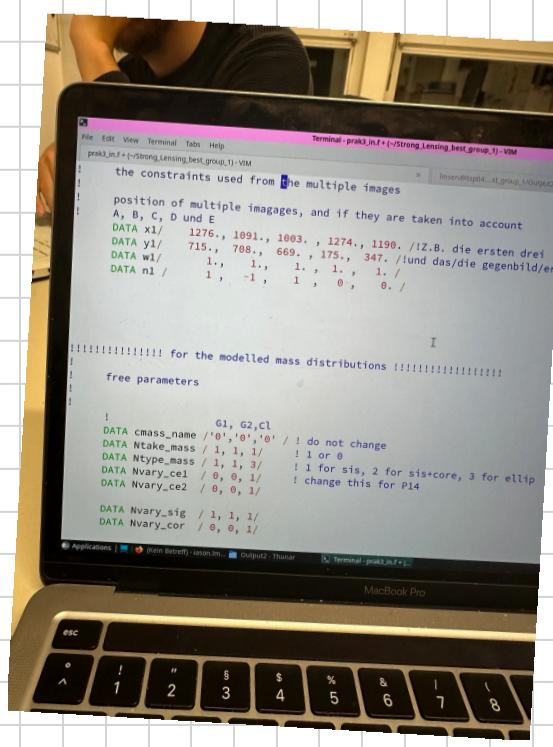
for the modelled mass distributions !!!!!!!

free parameters

```
G1 G2 Cl
DATA cmass_name /'0','0','0'/; do not change
DATA Ntke_mass / 0, 0, 1/; 1 or 0
DATA Ntype_mass / 1, 1, 3/; 1 for sis, 2 for sis+core, 3 for ellip
DATA Nvary_ce1 / 0, 0, 1/; 1 for sis, 2 for sis+core, 3 for ellip
DATA Nvary_ce2 / 0, 0, 1/; change this for P14
```

starting values and min/max values

```
G1 G2 Cl
DATA cel /1122.1 , 1067.8, 1184. /
DATA cel_min/1114.462, 1060.549, 1150.353/
DATA cel_max/1128.978, 1075.064, 1255.799/
!
DATA ce2 / 699.3, 746.3, 361. /
DATA ce2_min/ 680.619, 738.680, 330.568/
DATA ce2_max/ 701.355, 753.195, 430.532/
!
DATA sig / 120., 120., 1300. /
DATA sig_min/ 100., 100., 500. /
DATA sig_max/ 300., 300., 1500. /
!
DATA cor / 1., 1., 30. /
DATA cor_min/ .1, .1, 1. /
DATA cor_max/ 10., 10., 100. /
!
DATA (eps(j),j=1,nmass) /nmass * 0.05 /
DATA (eps_min(j),j=1,nmass) /nmass * 0.02 /
DATA (eps_max(j),j=1,nmass) /nmass * 0.2 /
!
DATA (phi(j),j=1,nmass) /nmass * 60.0 /
DATA (phi_min(j),j=1,nmass) /nmass * -90.0 /
DATA (phi_max(j),j=1,nmass) /nmass * 90.0 /
!
```



```
the constraints used from the multiple images
position of multiple imagages, and if they are taken into account
A, B, C, D und E
DATA xi1/ 1276., 1091., 1003., 1274., 1190. /IZ.B. die ersten drei
DATA yi1/ 715., 708., 669., 175., 347. /und das/die gegenüberliegenden
DATA wi1/ 1., 1., 1., 1., 1. /
DATA ni1/ 1., -1., 1., 0., 0. /
```

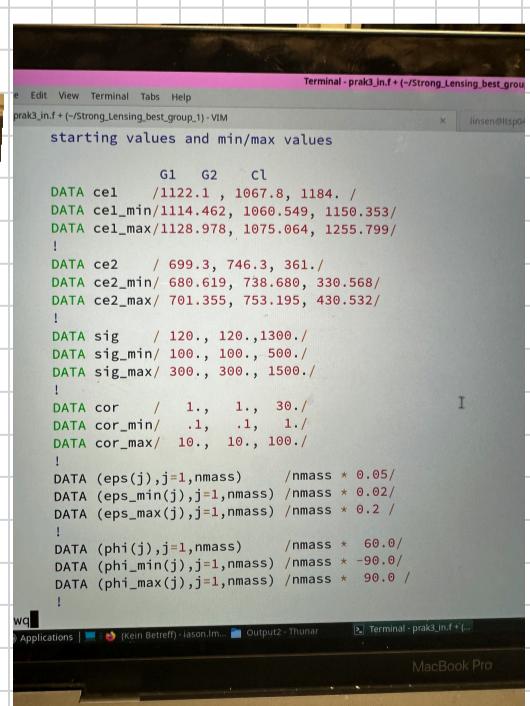
for the modelled mass distributions !!!!!!!

free parameters

```
G1 G2 Cl
DATA cmass_name /'0','0','0'/; do not change
DATA Ntke_mass / 0, 0, 1/; 1 or 0
DATA Ntype_mass / 1, 1, 3/; 1 for sis, 2 for sis+core, 3 for ellip
DATA Nvary_ce1 / 0, 0, 1/; 1 for sis, 2 for sis+core, 3 for ellip
DATA Nvary_ce2 / 0, 0, 1/; change this for P14
```

starting values and min/max values

```
G1 G2 Cl
DATA cel /1122.1 , 1067.8, 1184. /
DATA cel_min/1114.462, 1060.549, 1150.353/
DATA cel_max/1128.978, 1075.064, 1255.799/
!
DATA ce2 / 699.3, 746.3, 361. /
DATA ce2_min/ 680.619, 738.680, 330.568/
DATA ce2_max/ 701.355, 753.195, 430.532/
!
DATA sig / 120., 120., 1300. /
DATA sig_min/ 100., 100., 500. /
DATA sig_max/ 300., 300., 1500. /
!
DATA cor / 1., 1., 30. /
DATA cor_min/ .1, .1, 1. /
DATA cor_max/ 10., 10., 100. /
!
DATA (eps(j),j=1,nmass) /nmass * 0.05 /
DATA (eps_min(j),j=1,nmass) /nmass * 0.02 /
DATA (eps_max(j),j=1,nmass) /nmass * 0.2 /
!
DATA (phi(j),j=1,nmass) /nmass * 60.0 /
DATA (phi_min(j),j=1,nmass) /nmass * -90.0 /
DATA (phi_max(j),j=1,nmass) /nmass * 90.0 /
!
```



```
starting values and min/max values
G1 G2 Cl
DATA cel /1122.1 , 1067.8, 1205.835/
DATA cel_min/1114.462, 1060.549, 1150.353/
DATA cel_max/1128.978, 1075.064, 1255.799/
!
DATA ce2 / 699.3, 746.3, 388.050/
DATA ce2_min/ 680.619, 738.680, 330.568/
DATA ce2_max/ 701.355, 753.195, 430.532/
!
DATA sig / 120., 120., 1300. /
DATA sig_min/ 100., 100., 500. /
DATA sig_max/ 300., 300., 1500. /
!
DATA cor / 1., 1., 30. /
DATA cor_min/ .1, .1, 1. /
DATA cor_max/ 10., 10., 200. /
!
DATA (eps(j),j=1,nmass) /nmass * 0.05 /
DATA (eps_min(j),j=1,nmass) /nmass * 0.02 /
DATA (eps_max(j),j=1,nmass) /nmass * 0.2 /
!
DATA (phi(j),j=1,nmass) /nmass * 60.0 /
DATA (phi_min(j),j=1,nmass) /nmass * -90.0 /
DATA (phi_max(j),j=1,nmass) /nmass * 90.0 /
!
```