

# Présentation de la démarche

## Etape de réglage et objectifs

**Réglage de l'énergie de coupure:** modifier l'angle d'incidence des miroirs et bouger les fentes en conséquence

**Choix de la gamme d'énergie :** définir toutes les valeurs nécessaires à l'alignement

**Maximisation du flux :** ajuster le parallélisme des deux cristaux du monochromateur pour toute la gamme d'énergie

**Focalisation verticale :** ajuster la courbure du second miroir

**Position verticale :** ajuster la variation de hauteur de la table pendant les spectres pour suivre le faisceau

**Focalisation horizontale :** ajuster la variation de courbure du second cristal du monochromateur sur toute la gamme d'énergie

**Position horizontale :** ajuster le tilt du second cristal du monochromateur pour toute la gamme d'énergie

**Calibration de l'énergie :** recalibrer la valeur en énergie sélectionnée par le monochromateur

## Commande

moveM1M2angle  $A_{\text{final}}$

alignment\_parameters

acc\_alignment

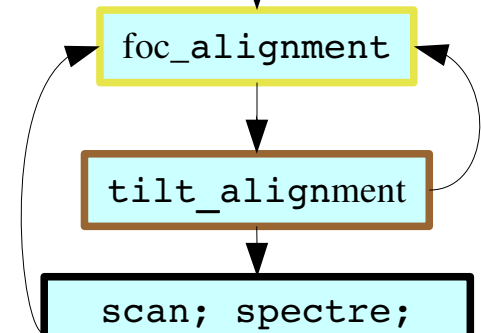
mc2\_alignment

table\_alignment

foc\_alignment

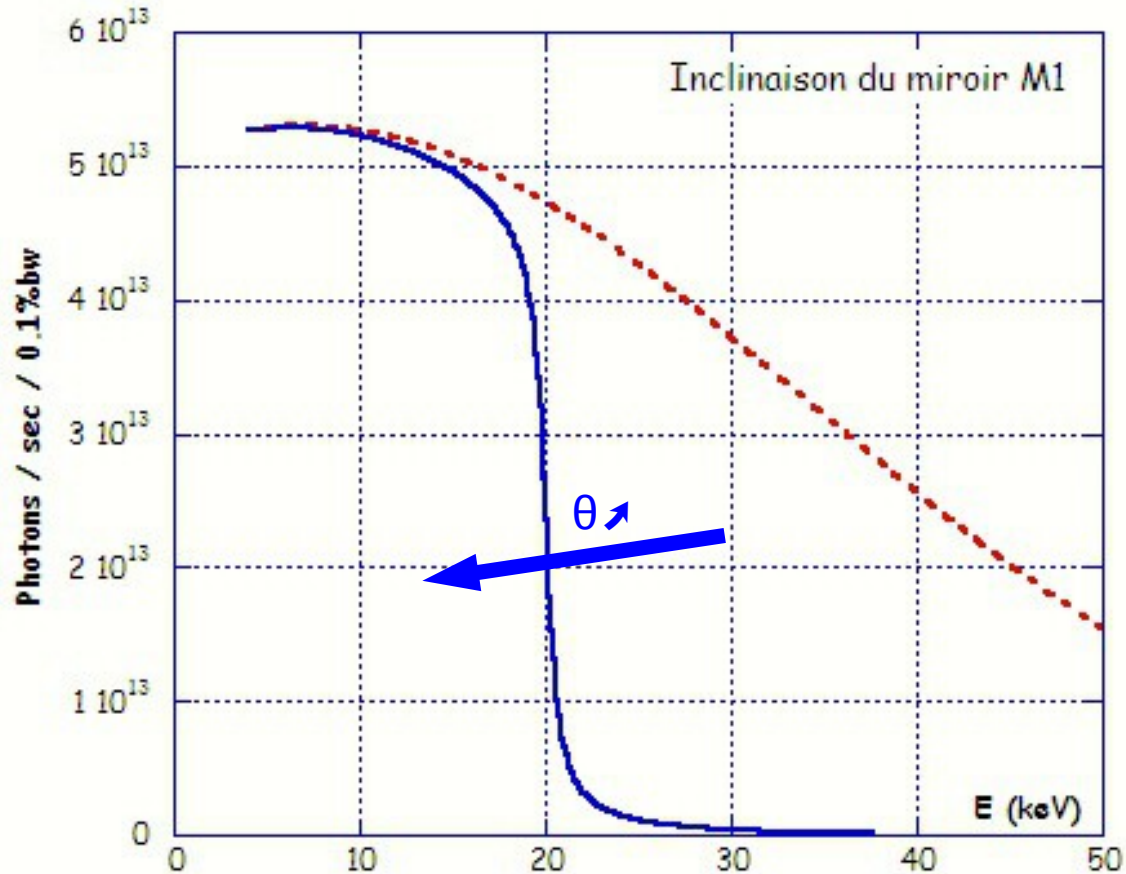
tilt\_alignment

scan; spectre;  
moveE...; setE...



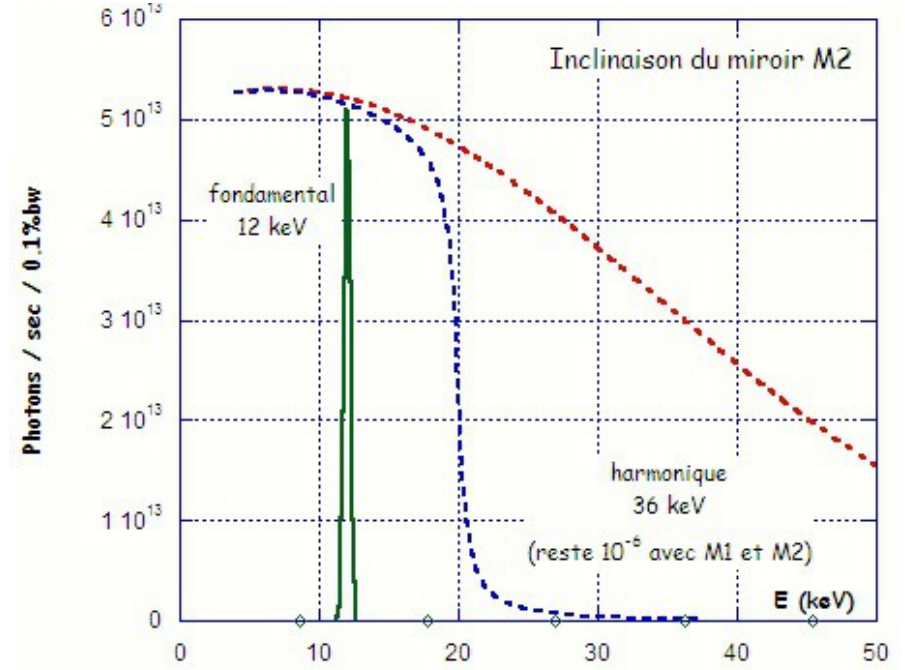
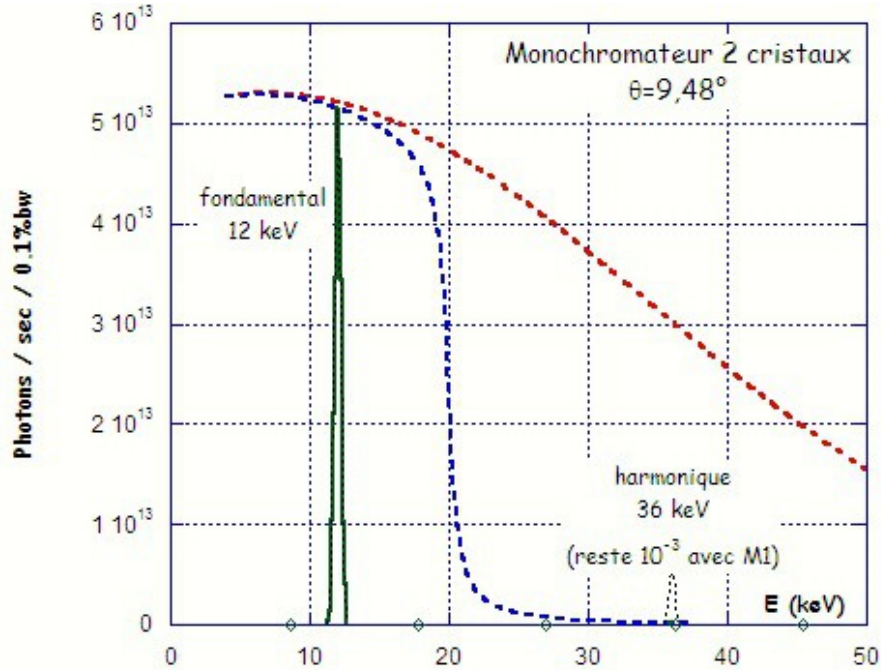
Réglage de l'énergie de coupure: modifier l'angle d'incidence des miroirs et  
bouger les fentes en conséquence

moveM1M2angle  $A_{\text{final}}$



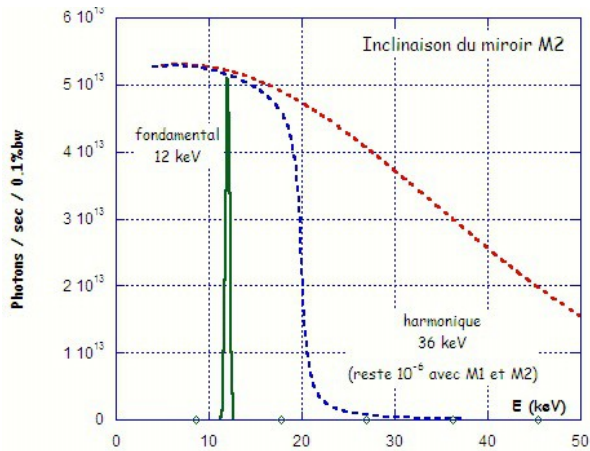
Réglage de l'énergie de coupure: modifier l'angle d'incidence des miroirs et  
bouger les fentes en conséquence

moveM1M2angle  $A_{\text{final}}$



**Réglage de l'énergie de coupure:** modifier l'angle d'incidence des miroirs et bouger les fentes en conséquence

moveM1M2angle  $A_{\text{final}}$



Choix de l'angle :

- le spectre s'étend jusqu'à 1 keV après le seuil
- il faut se laisser une marge (+ 2 keV après la fin du spectre)

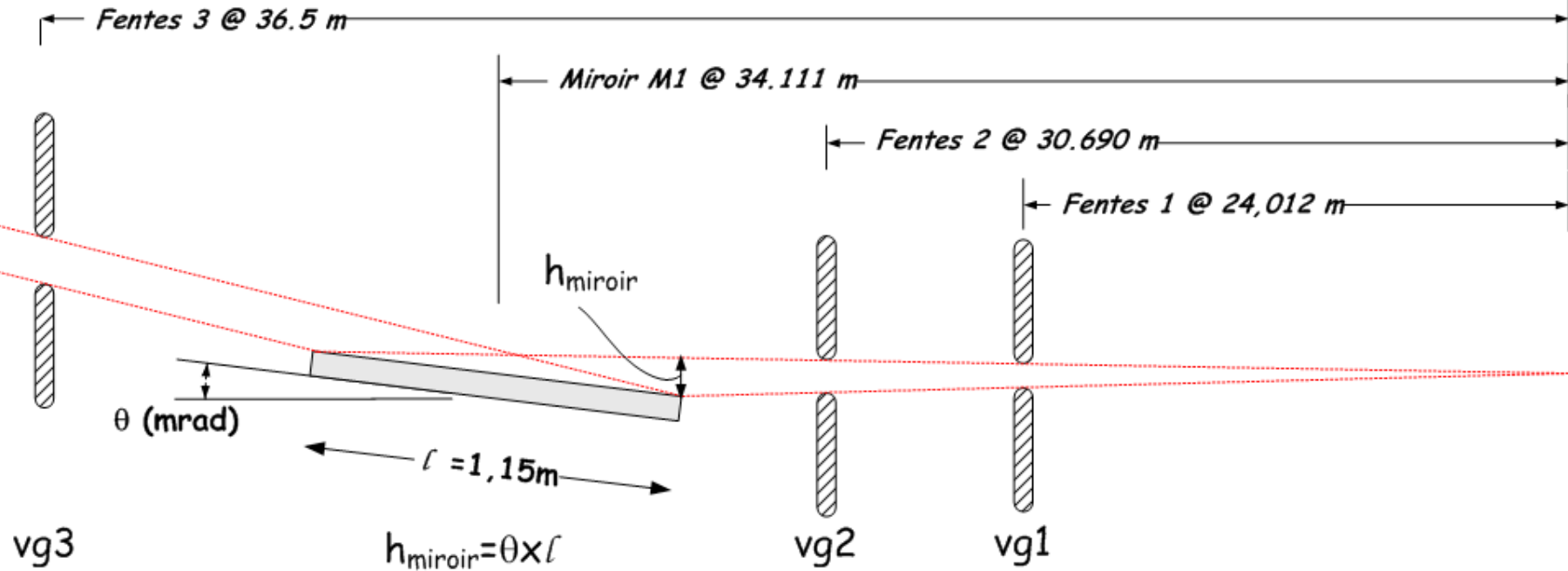
$$\theta_{\text{miroir}} = 59/E_{\text{fin}} = \dots\dots\dots \text{ mrad}$$

**moveM1M2angle .....**

Contrôler les angles à l'aide des inclinomètres qui mesurent directement les angles d'incidence et corriger les valeurs moteurs de ma1 et ma2.

Réglage de l'énergie de coupure: modifier l'angle d'incidence des miroirs et  
bouger les fentes en conséquence

moveM1M2angle  $A_{\text{final}}$



$$vg1 = \theta \cdot l \cdot \frac{D_{\text{fentes1-source}}}{D_{\text{M1-source}}}$$

$$vg2 = \theta \cdot l \cdot \frac{D_{\text{fentes2-source}}}{D_{\text{M1-source}}}$$

$$vg3 = \theta \cdot l$$

$\theta$  en mrad,  $l$  en m  
→ ouvertures en mm

Choix de la gamme d'énergie : définir toutes les valeurs nécessaires à l'alignement

alignment\_parameters

```
1959.EXAFS> alignment_parameters
Energy of the absorption edge (keV) (7.112)? 8.979
Start energy of the spectra (keV) (7)? 8.7
Ending energy of the spectra (keV) (7.9)? 10
mc2 optimization will be done at 8.979 keV.
Table and tilt alignments will be done between 8.700000 and 10.000000 keV.
acc, foc, c1, c2 will be done for:
8.5 keV
9.0 keV
9.5 keV
10.0 keV
File name for alignment parameters (align.01Oct14)? align.15Oct14
Alignment parameters will be saved in /home/fame/Align/align.15Oct14
Do you want to write the focus parameters (if not, all the optimization you already did will
be lost)? (YES)?
Enter focalisation position (slit5,sample,slit6,CAS) (sample)?

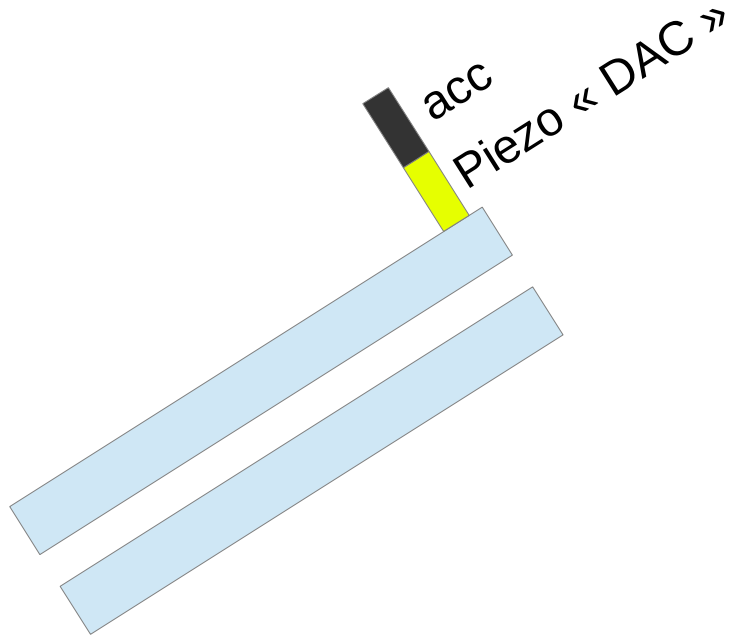
Do not forget: - to check the CONFMONO configuration: sag. foc., table and acc should move.
               - to go to start energy: 8.5 keV.
```

`tail -f Align/align.15Oct14`

```
***** New automatic alignment - Wed Oct 01 09:54:53 2014 *****
Initial energy: 8.50013 keV
Initial parameters:
mono=22.324 foc=0.529419 acc=4.95237 alignment_motor(tte or Xech)=22.324
hg5=4 hg6=4 hg7=5 hg8=4.99984
c1=0.855241 c2=0.203596 tlt=-5.34394 tt=-2.10551
```

**Maximisation du flux : ajuster le parallélisme des deux cristaux du monochromateur pour toute la gamme d'énergie**

acc\_alignment



```
spec
REGULATION PID
WSEUIL=
<space> selection      <+/-> ajustement      <return> saisie      <q> fin
<a/m> auto/manu      <f> Fech      <c> Efface      <L/1> limites
  Boucle 1      AUTO      DAC=5.979
C=0.0      P=0,0      I=0,0      D=0,0      %mag=-0,012      E=0,0121
```

```
1960.EXAFS> acc_alignment
```

```
acc will be optimised for:
```

```
8.5 keV
```

```
9.0 keV
```

```
9.5 keV
```

```
10.0 keV
```

```
Alignment parameters will be saved in /home/fame/Align/align.15Oct14
```

```
Please check that you are already at 8.5 keV.
```

```
Do you want to proceed? (NO)?
```

```
1961.EXAFS> mc2_alignment
```

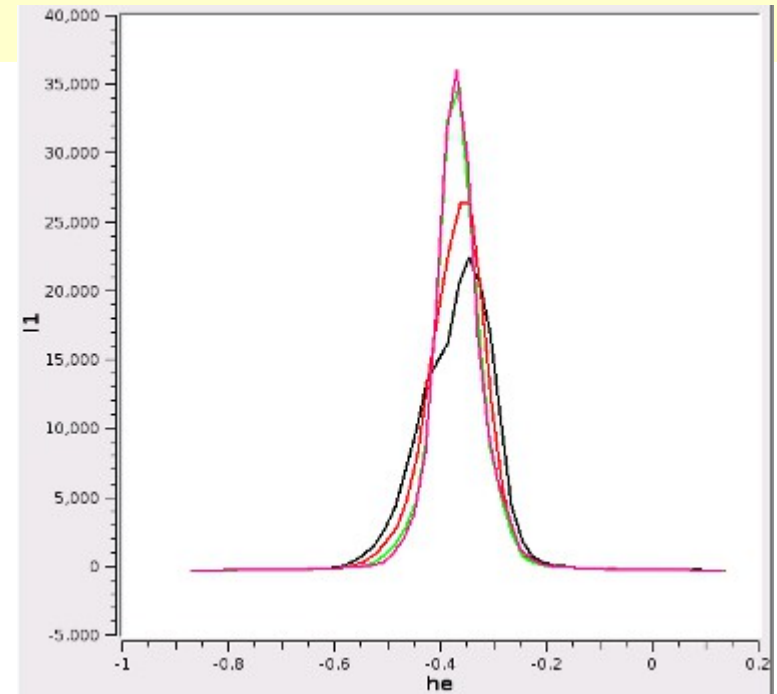
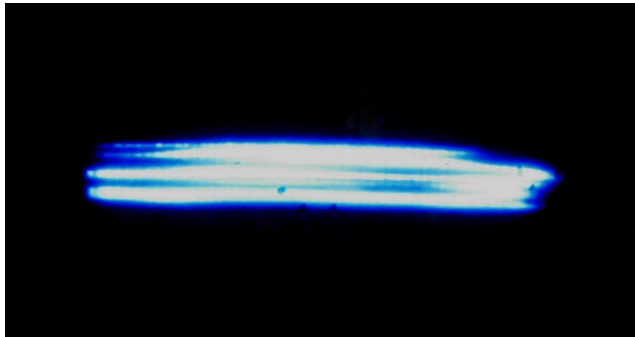
```
mc2 optimization will be done at 8.979000 keV with motor he.
```

```
Alignment parameters will be saved in /home/fame/Align/align.15Oct14
```

```
Be sure that:
```

- the beam goes through the alignment slits!
- gam is correct.

```
Do you want to proceed? (NO)?
```



```
***** mc2 optimization at 8.979000 keV *****
```

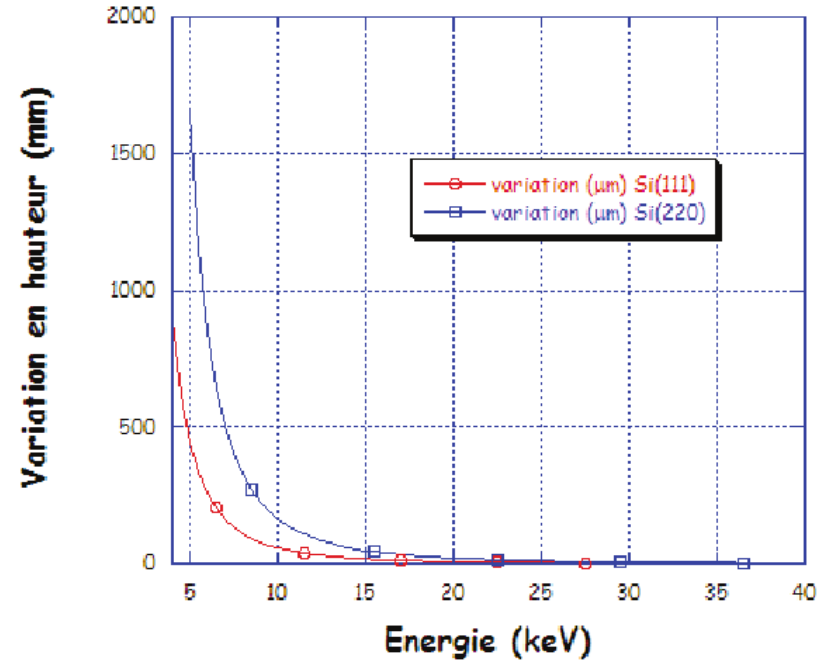
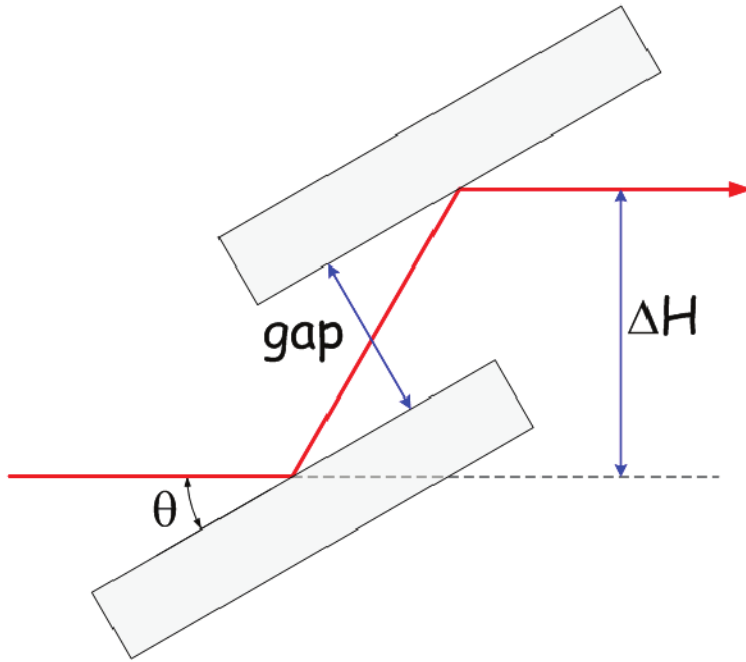
- For mc2=385, FWTM is: 0.223 and FWHM is: 0.118513
- For mc2=390, FWTM is: 0.263 and FWHM is: 0.151232
- For mc2=385, FWTM is: 0.220 and FWHM is: 0.119
- For mc2=380, FWTM is: 0.184 and FWHM is: 0.084
- For mc2=375, FWTM is: 0.179 and FWHM is: 0.078
- For mc2=370, FWTM is: 0.204 and FWHM is: 0.109

```
After alignment, beam height (FWHM) is 0.079 mm with mc2=375
```



**Position verticale :** ajuster la variation de hauteur de la table pendant les spectres pour suivre le faisceau pour suivre le faisceau

table\_alignment



$$\Delta H = 2 \cdot (g + \text{gapoffset}) \cdot \cos(\theta)$$

```
1962.EXAFS> table_alignment
```

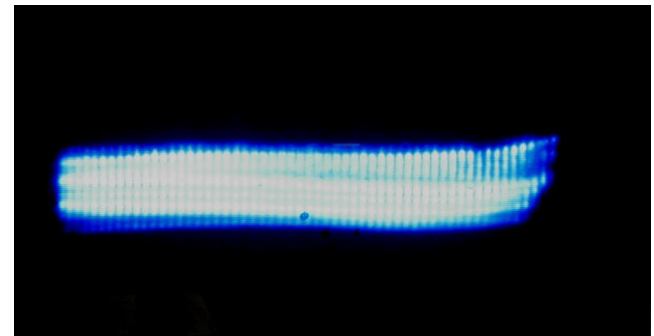
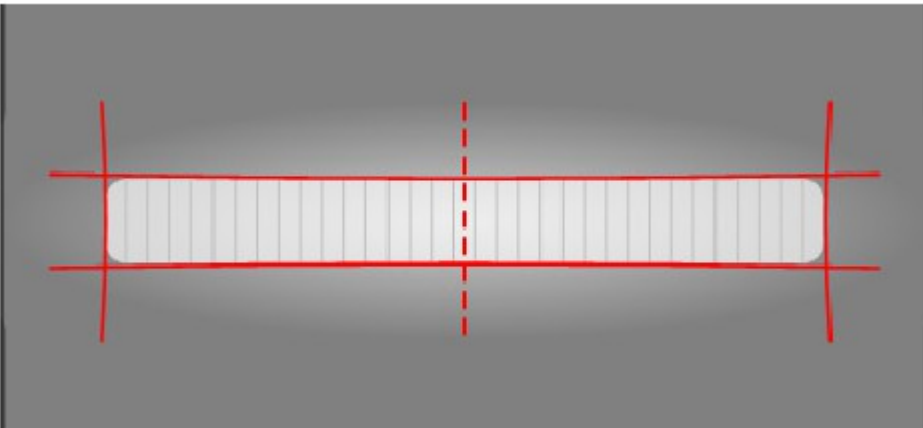
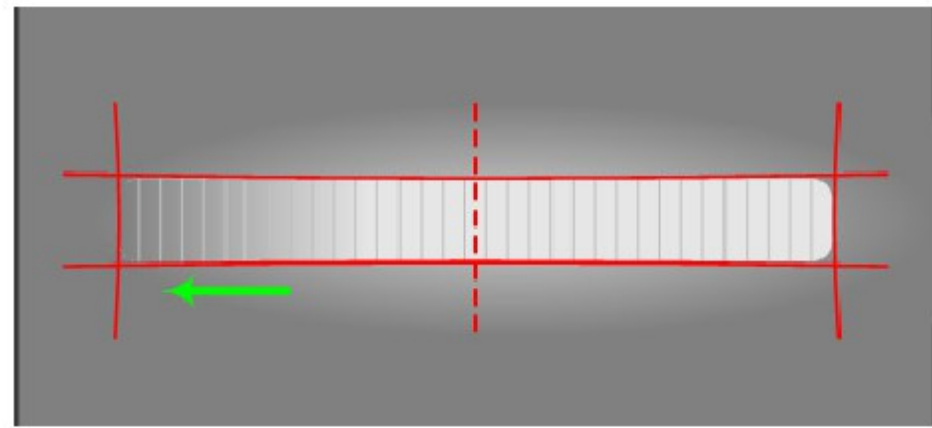
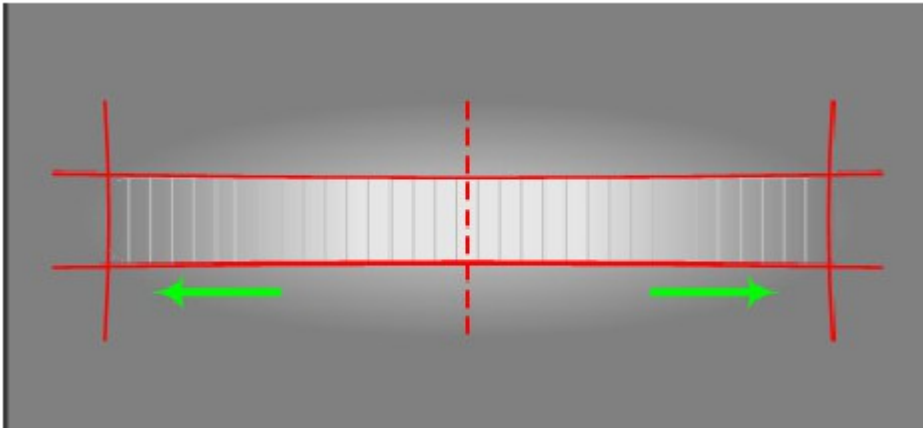
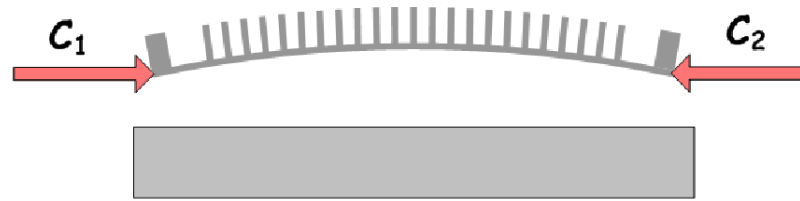
```
Table alignment will be done between 8.700000 and 10.000000 keV with motor he.
```

```
Alignment parameters will be saved in /home/fame/Align/align.15Oct14
```

```
Do you want to proceed? (NO)?
```

**Focalisation horizontale :** ajuster la variation de courbure du second cristal du monochromateur sur toute la gamme d'énergie

foc\_alignment

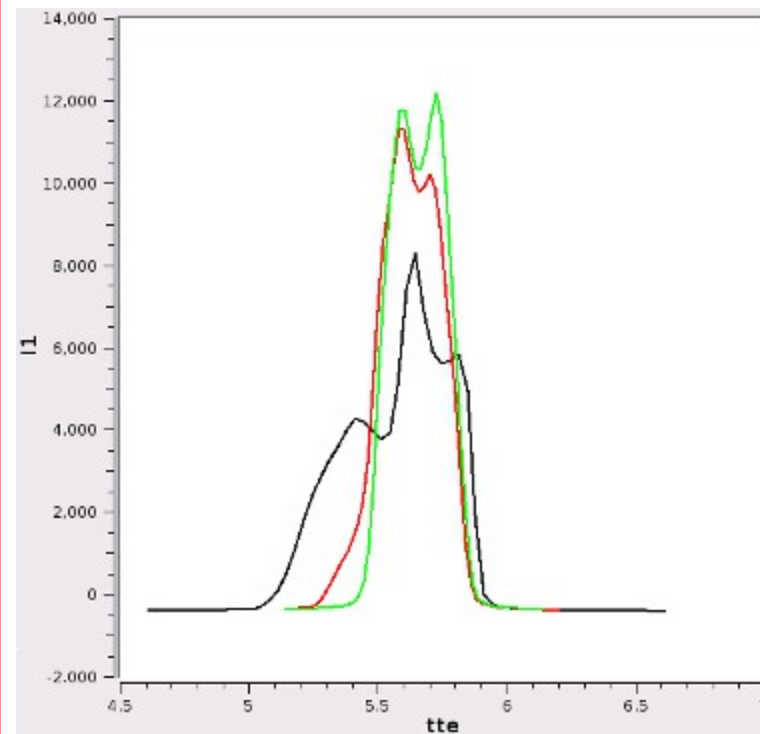


## Focalisation horizontale : ajuster la variation de courbure du second cristal du monochromateur sur toute la gamme d'énergie

foc\_alignment

```
***** foc optimisation for 9.00006 keV *****
Before alignment, foc=0.54941 and FWHM=0.313
After alignment, foc=0.546814 and FWHM=0.306

***** c1, c2 optimisation for 9.00006 keV *****
For scan 15:
- FWHM is: 0.306093
- FW10M is: 0.453521
- Intensity difference between the two maxima: 10 %
- Iteration 1:
c1=0.872636 c2=0.220991
--- Iteration 1 for c1-c2 :
For scan 16:
- FWHM is: 0.281775
- FW10M is: 0.420258
- Intensity difference between the two maxima: 14 %
--- Iteration 2 for c1-c2 :
For scan 17:
- FWHM is: 0.288842
- FW10M is: 0.433128
- Intensity difference between the two maxima: 6 %
--- Iteration 1 for -c1+c2 :
For scan 18:
- FWHM is: 0.301188
- FW10M is: 0.460042
- Intensity difference between the two maxima: 11 %
--- Iteration 1 for c1 positive:
For scan 19:
- FWHM is: 0.295375
- FW10M is: 0.381726
- Intensity difference between the two maxima: 3 %
New values: c1=0.876644 c2=0.218988
```



**Position horizontale : ajuster le tilt du second cristal du monochromateur pour toute la gamme d'énergie**

tilt\_alignment

\*\*\*\*\* Tilt optimisation between 8.700000 and 10.000000 keV \*\*\*\*\*

- Iteration 1:

tilt=-5.34394    tt=-2.10551

Center for 8.700000 keV (scan 27): 5.631050

Center for 10.000000 keV (scan 29): 5.721817

Shift between 8.700000 and 10.000000 keV: 0.090767 mm

- Iteration 2:

tilt=-5.34802    tt=-1.69701

Center for 10.000000 keV (scan 30): 5.788253

Center for 8.700000 keV (scan 31): 5.771852

Shift between 8.700000 and 10.000000 keV: 0.016400 mm

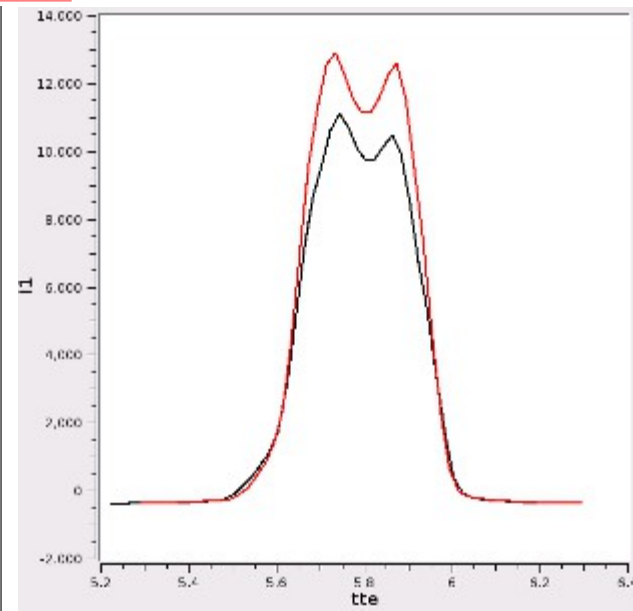
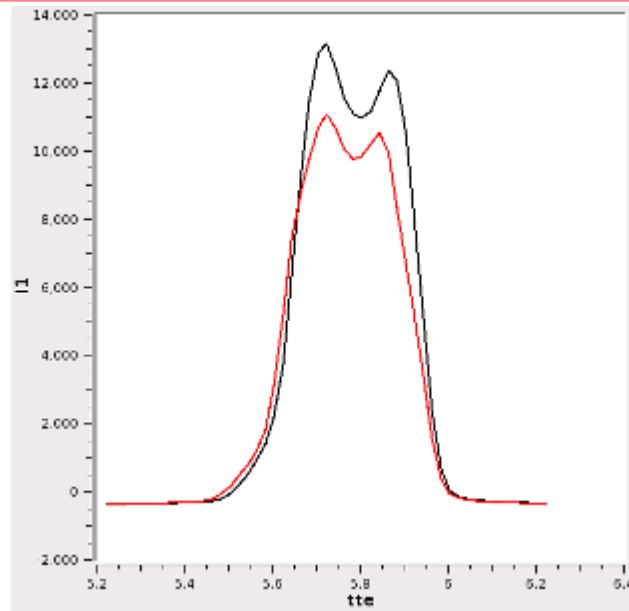
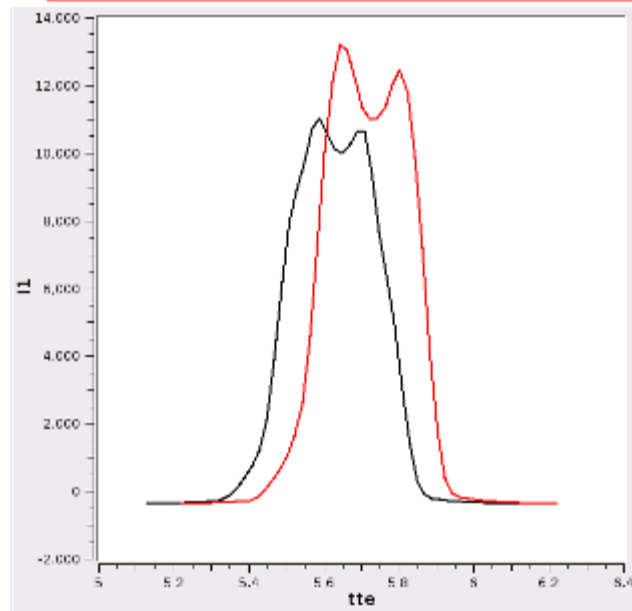
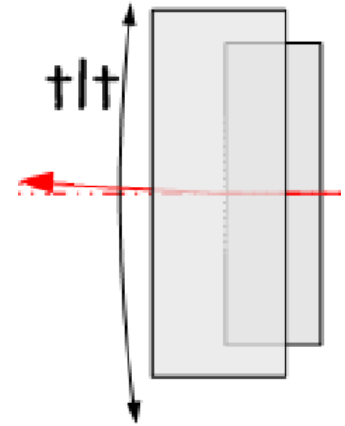
- Iteration 3:

tilt=-5.34875    tt=-1.62326

Center for 8.700000 keV (scan 32): 5.793403

Center for 10.000000 keV (scan 33): 5.793969

Shift between 8.700000 and 10.000000 keV: 0.000566 mm



Calibration de l'énergie : recalculer la valeur en énergie sélectionnée par le monochromateur

scan; spectre;  
moveE...; setE...

On définit les paramètres de scan :

```
1980.EXAFS> scan
```

On enregistre le spectre jusqu'au seuil :

```
1981.EXAFS> spectre
```

On visualise le spectre avec PyMCA.  
Dérivée du seuil → détermination du E0  
Recherche du seuil sur la page web

```
1982.EXAFS> moveE E0
```

```
1983.EXAFS> setE Eseuil
```

