

Images EROS -> CDS

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10 juillet 2023

[Voir la réunion du 16 mai 2023](#)

[Et la présentation sur les images FITS](#)

Ce qui a été fait depuis le 16 mai

- Nombreuses améliorations des programmes cacimgfsv.cc et cbszimg.cc
- Les scripts de productions des images code d et code e ont été développés et testés
- Christophe a fait des analyses de la qualité de la propagation de la transformation astrométrique aux images courantes
- Implémentation de l'utilisation de la transfo des 4 quarts de CCD des images de référence pour déterminer la transfo des images courantes - Pas d'amélioration si on reste avec une transformation linéaire
- Changement de convention pour les codes de traitement:
 - Images de références avec code **c** sont transformées et écrites avec le code **d**
 - Images courantes, code **r** sont transformées et écrites avec le code **e**
- ***On a coché toutes les cases de la liste des tâches à faire du 16 mai !***
- Bonus: amélioration du programme de relecture / vérification des fichiers ascii jread.cc et développement des scripts d'exécution en batch

[cbszimg.cc](https://gitlab.in2p3.fr/SCosmoTools/ErosAnaLC) : Conversion images de référence

cbszimg.cc : recopie de l'image FITS avec BSCALE et BZERO , sans rien changer d'autres - A utiliser pour les images de référence (compositées + astrométrie + changement des axes) - code de traitement **c** - image de sortie avec code de traitement **d**

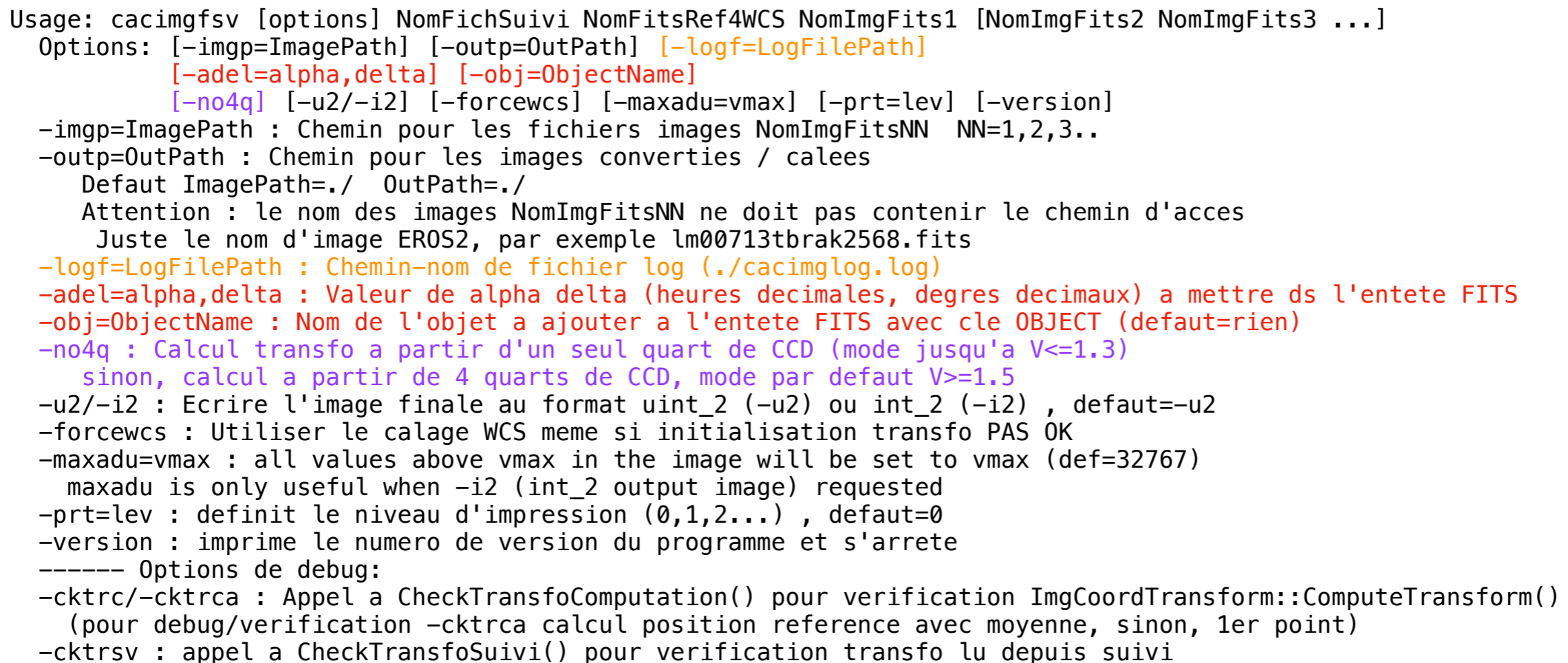
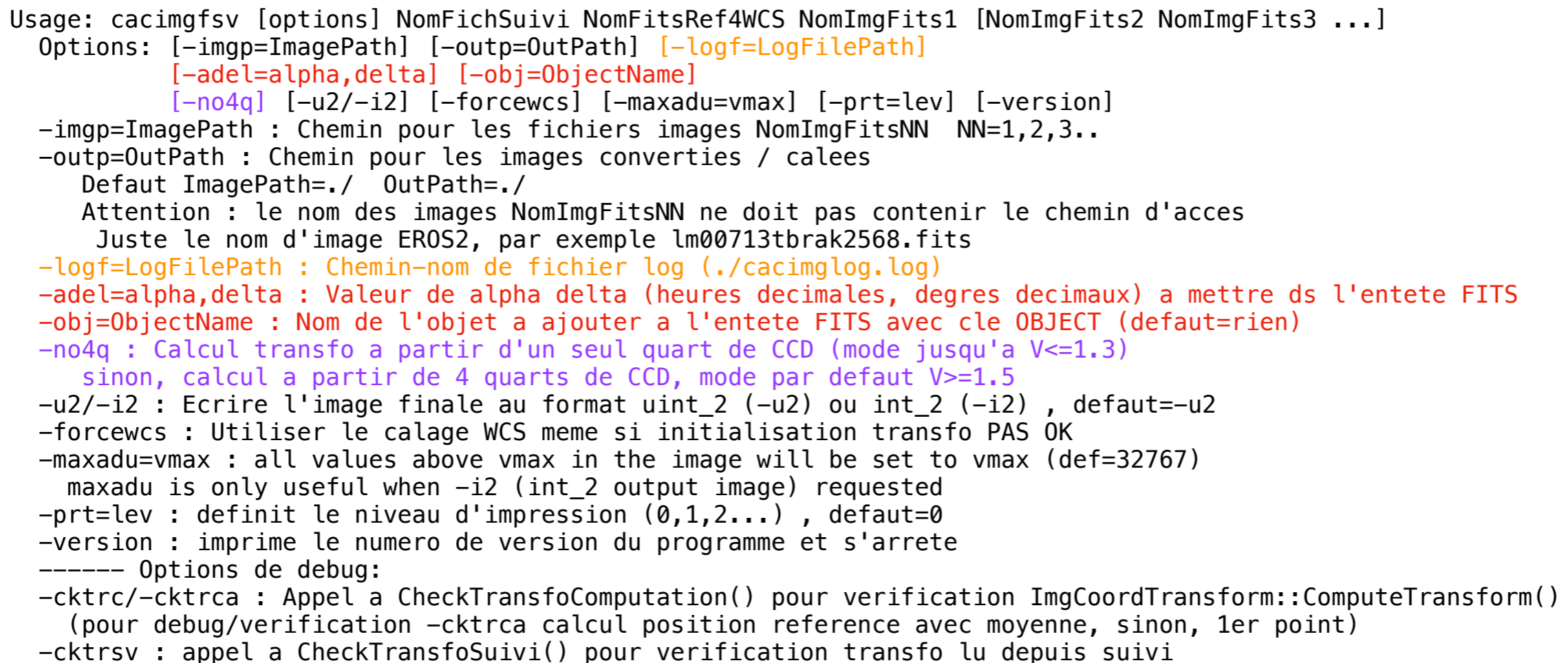
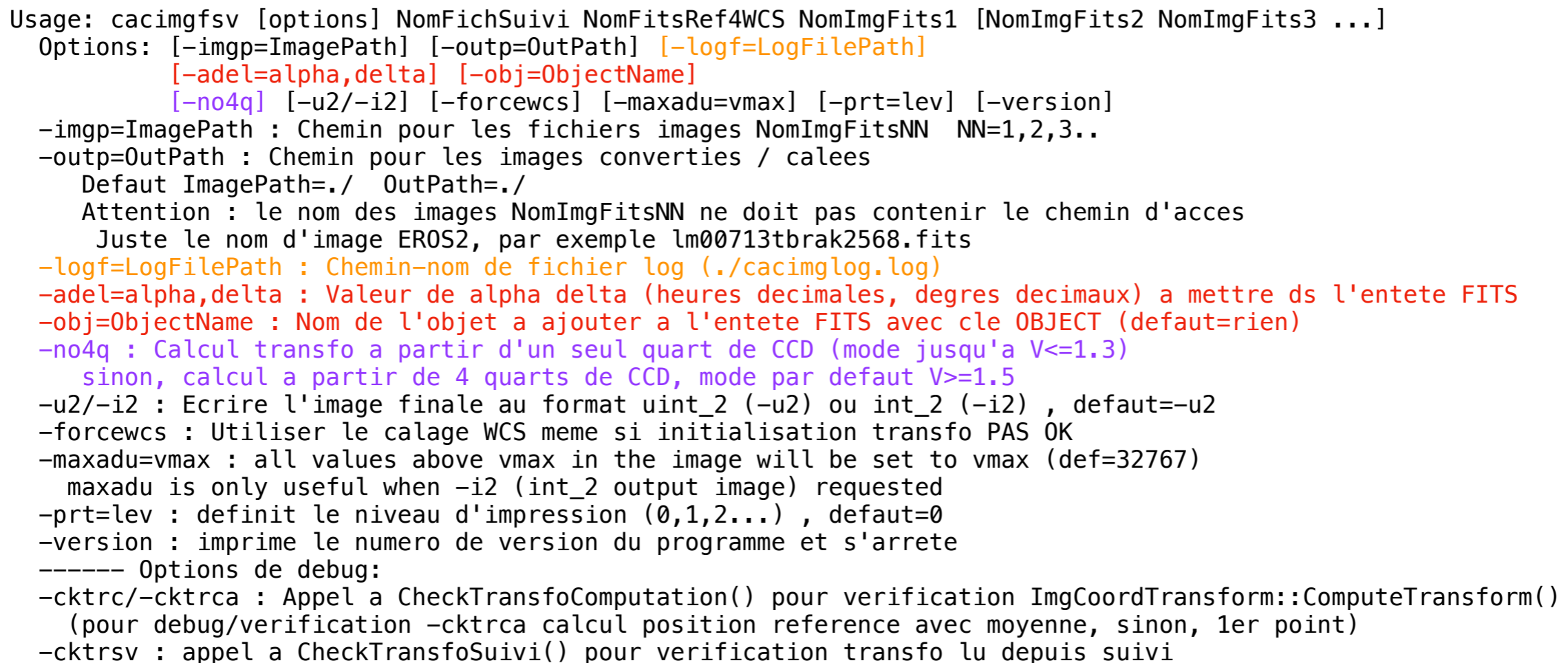
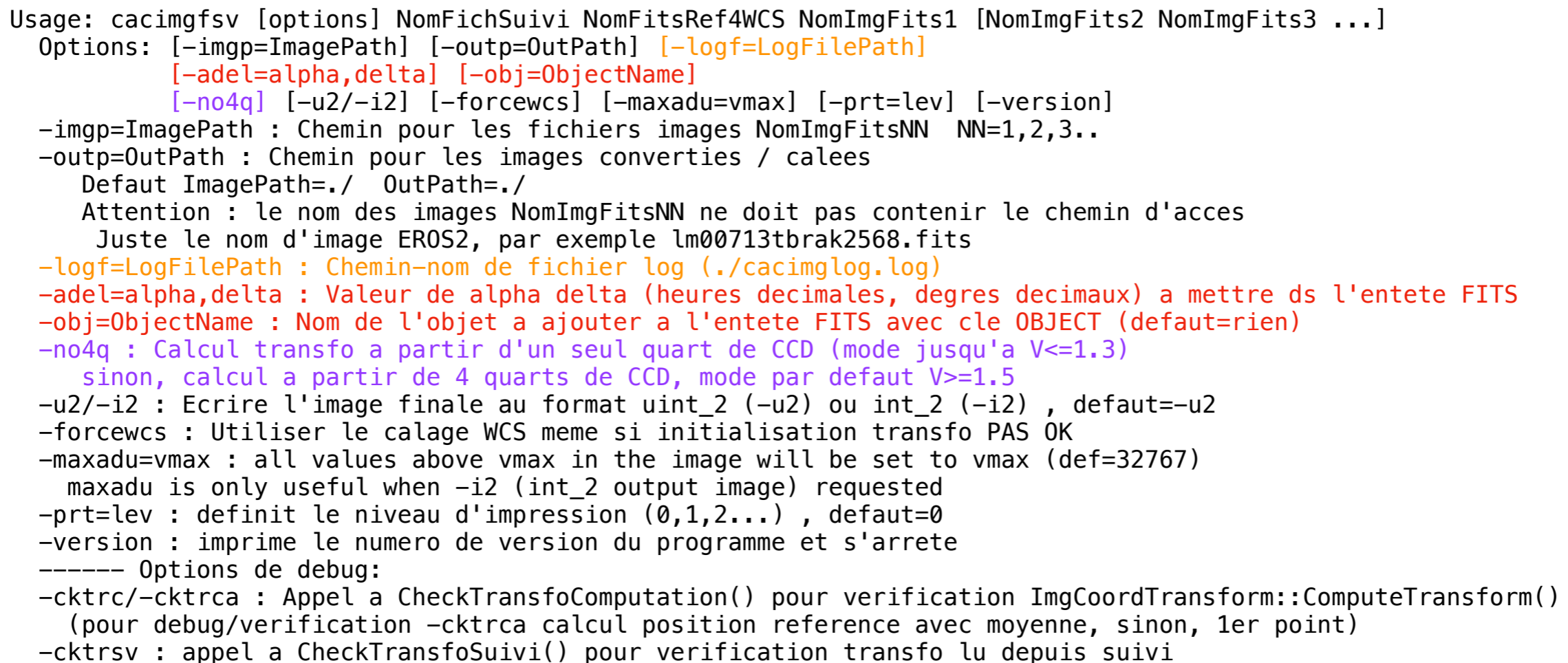
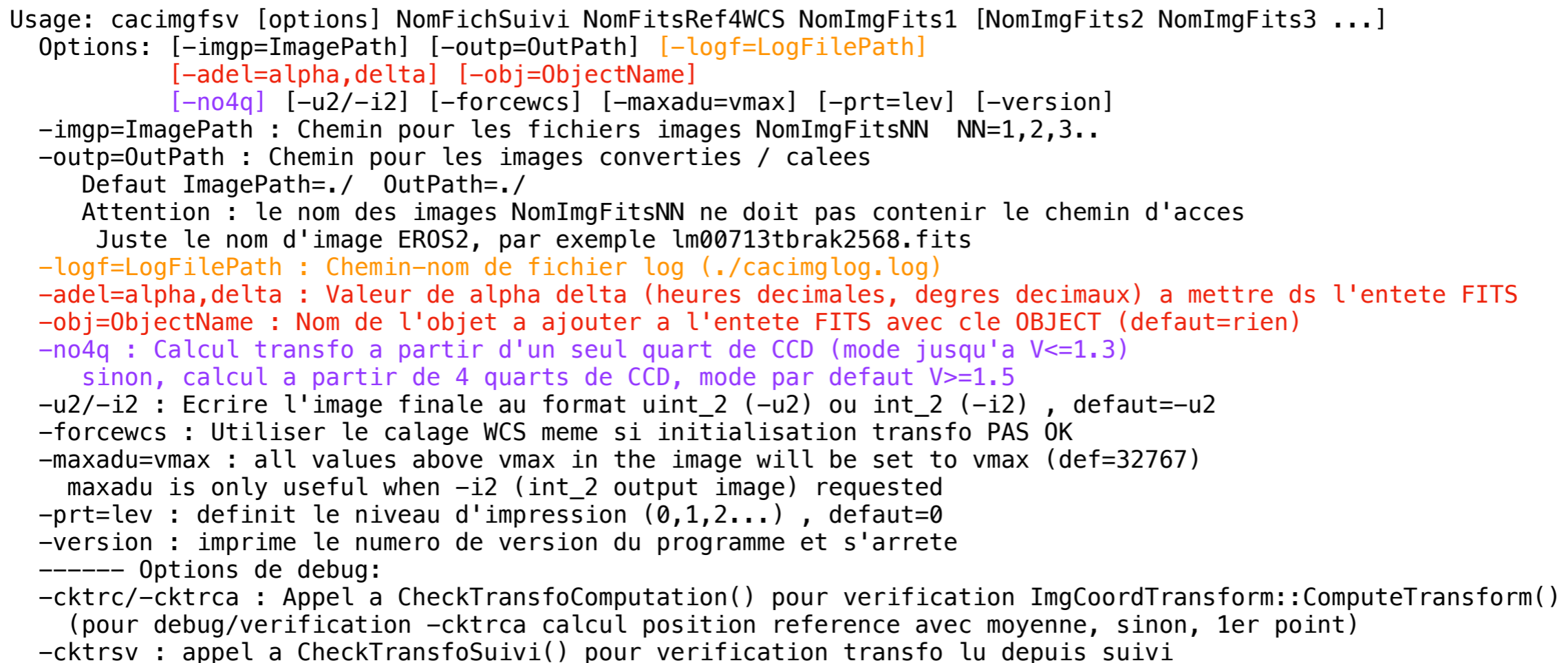
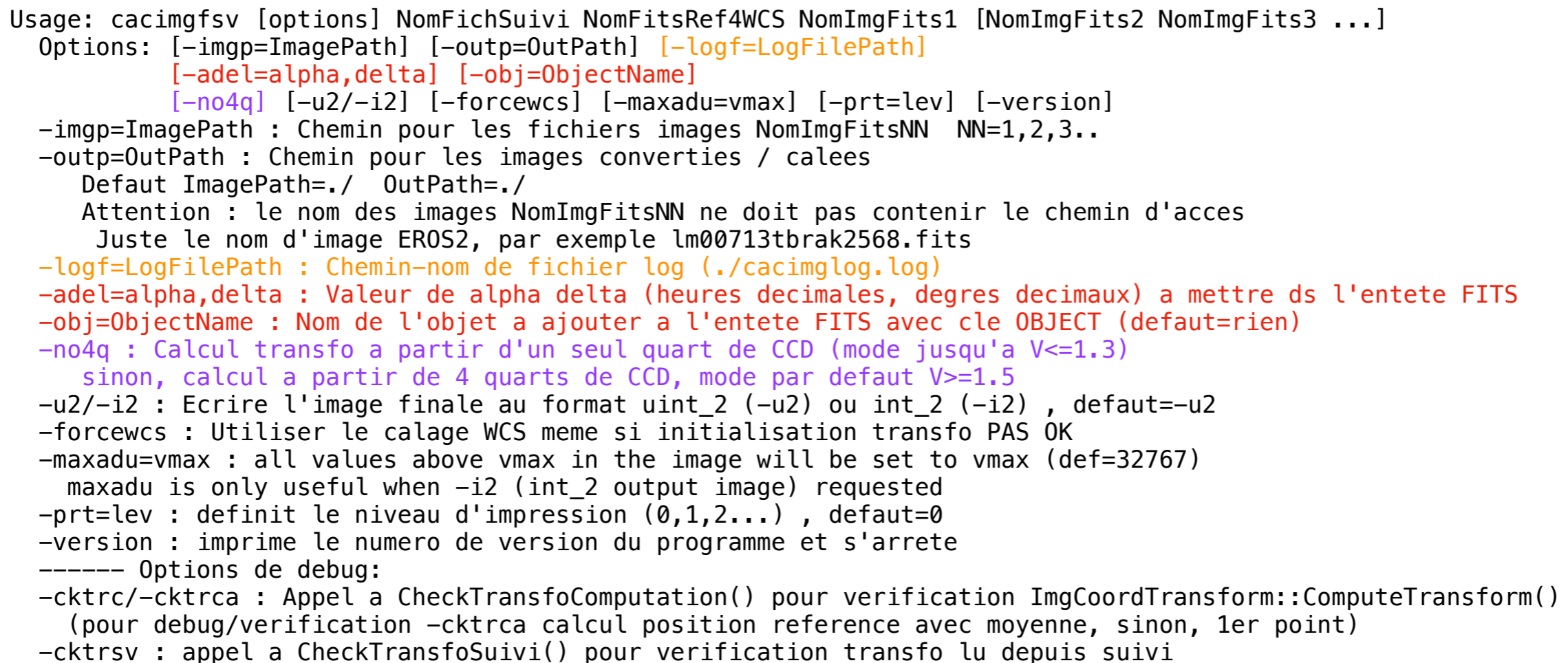
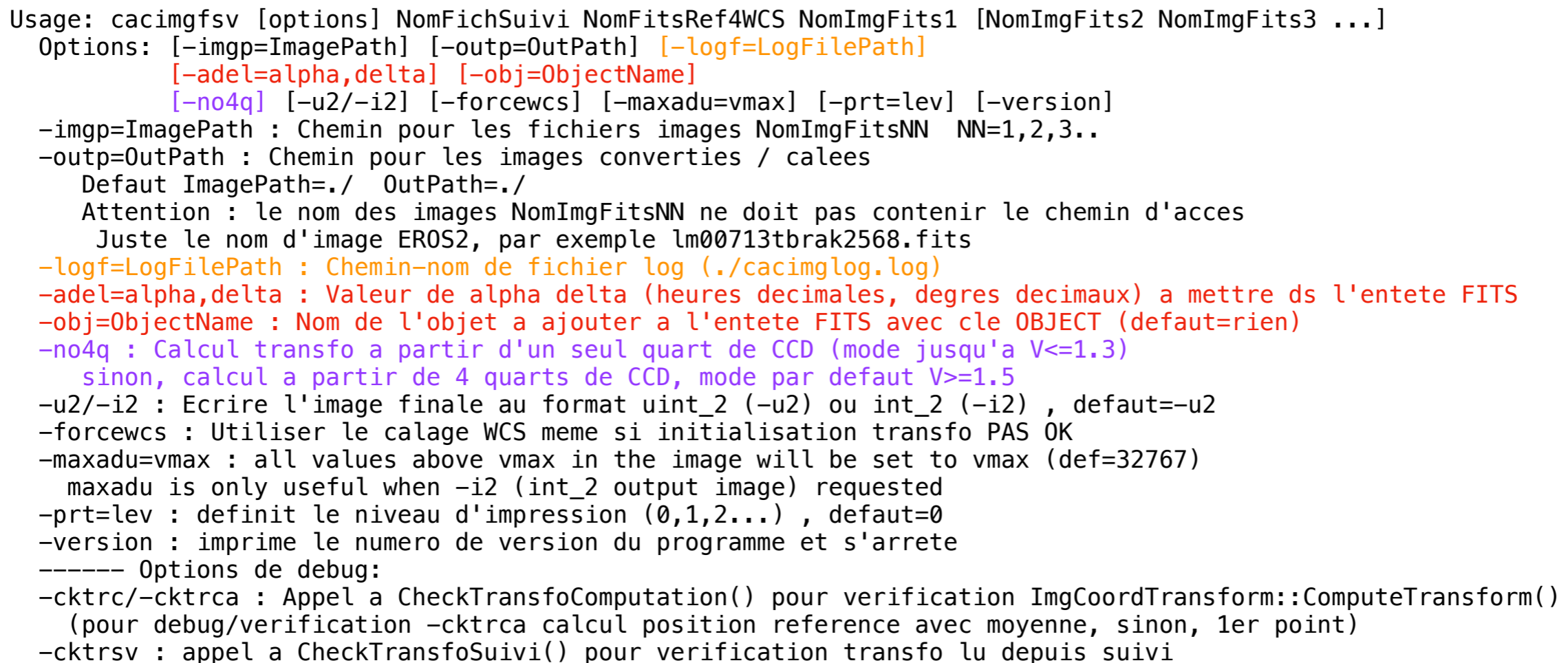
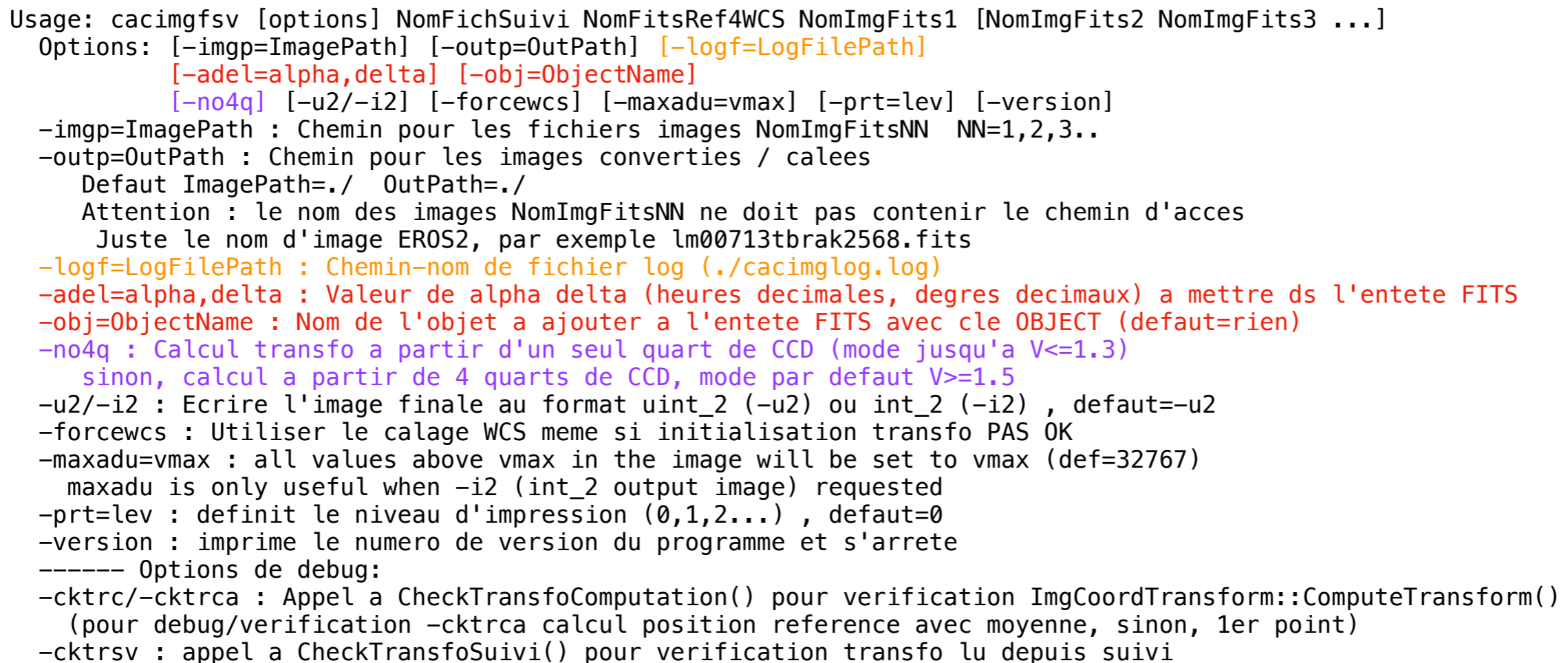
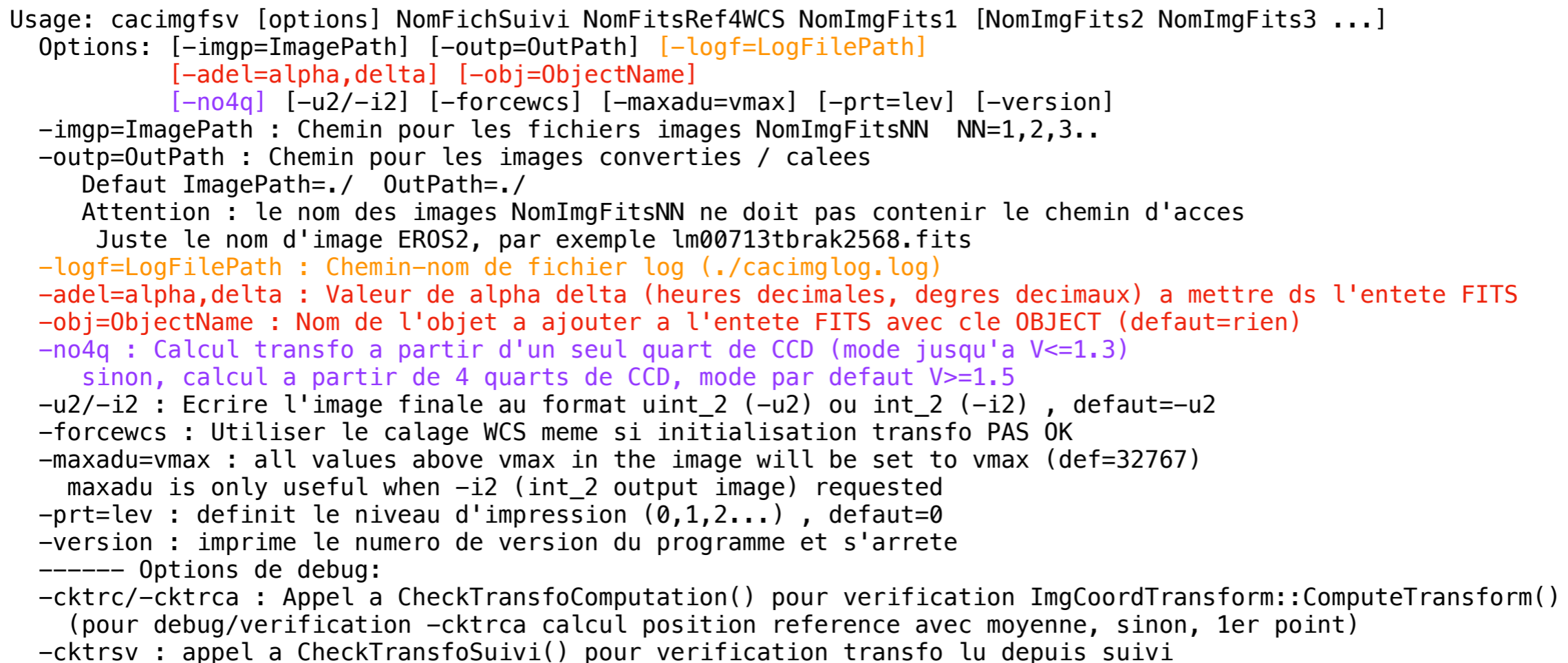
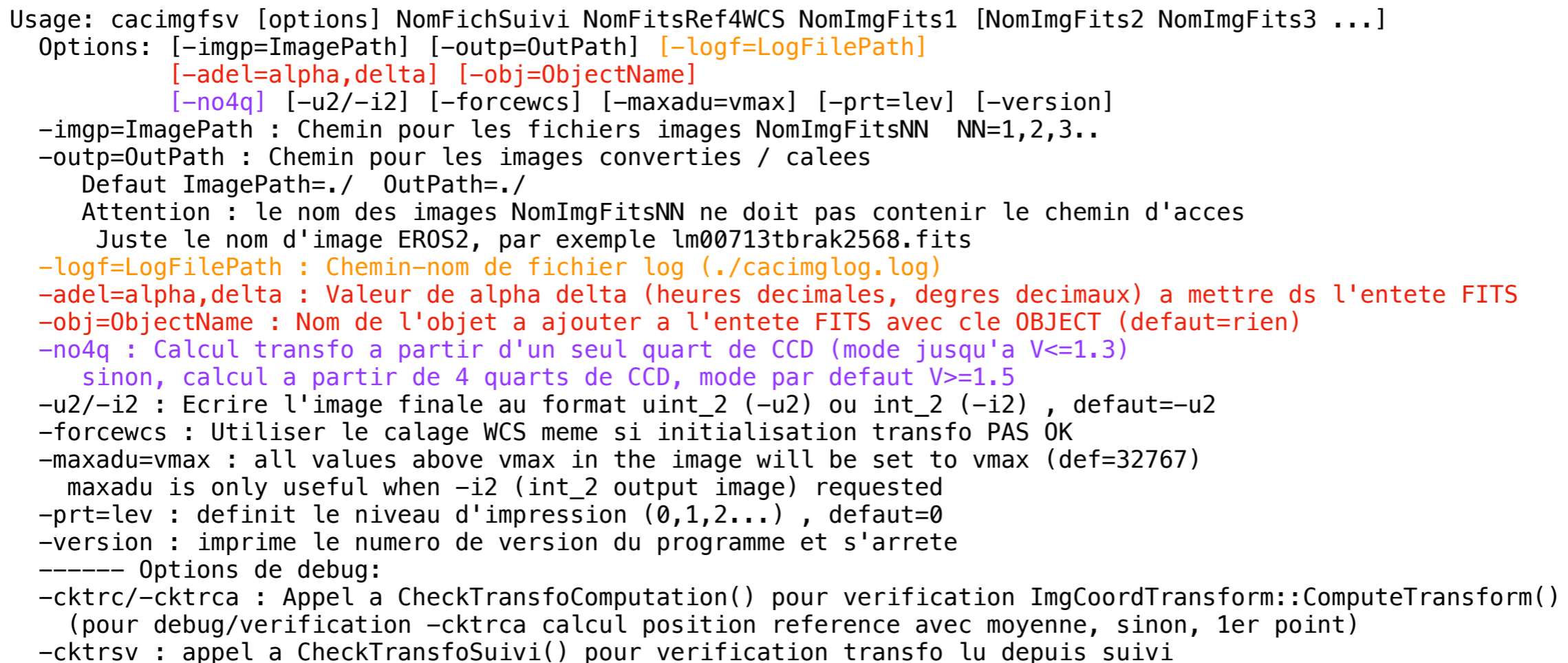
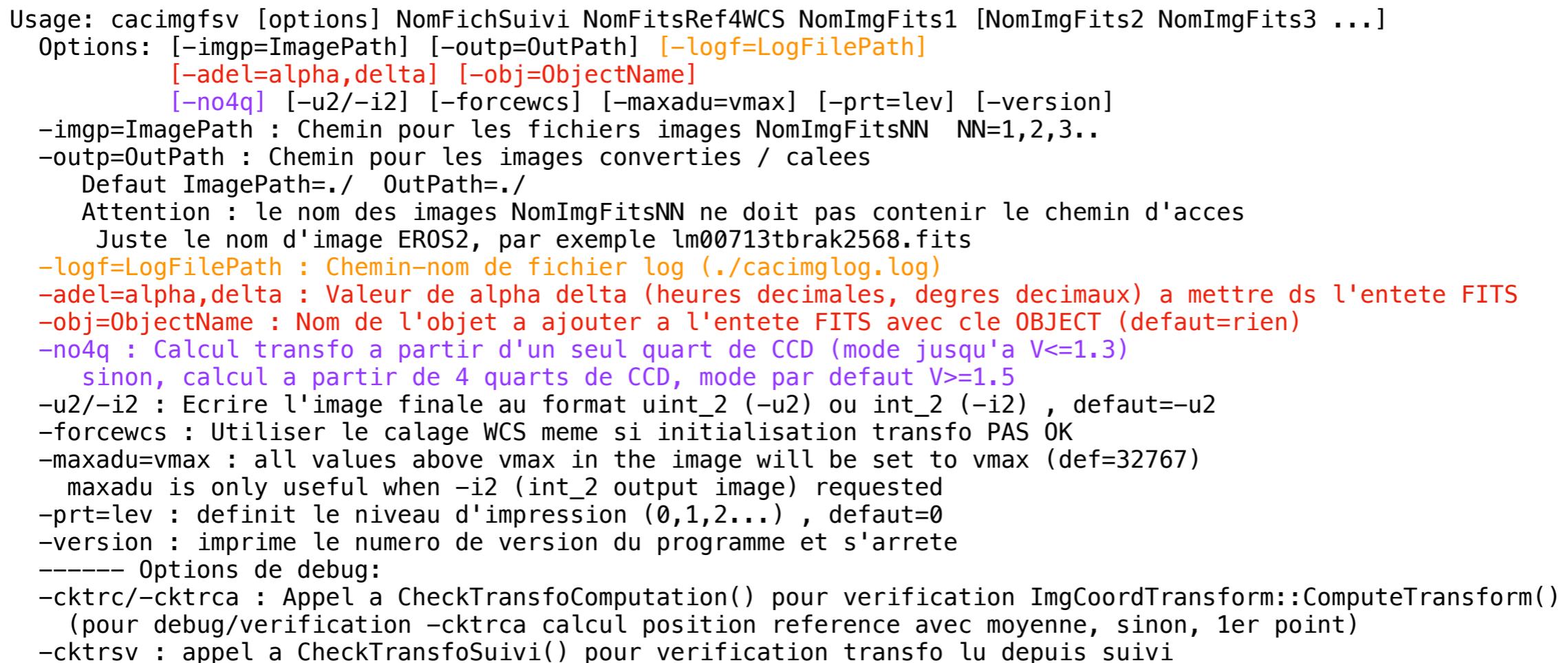
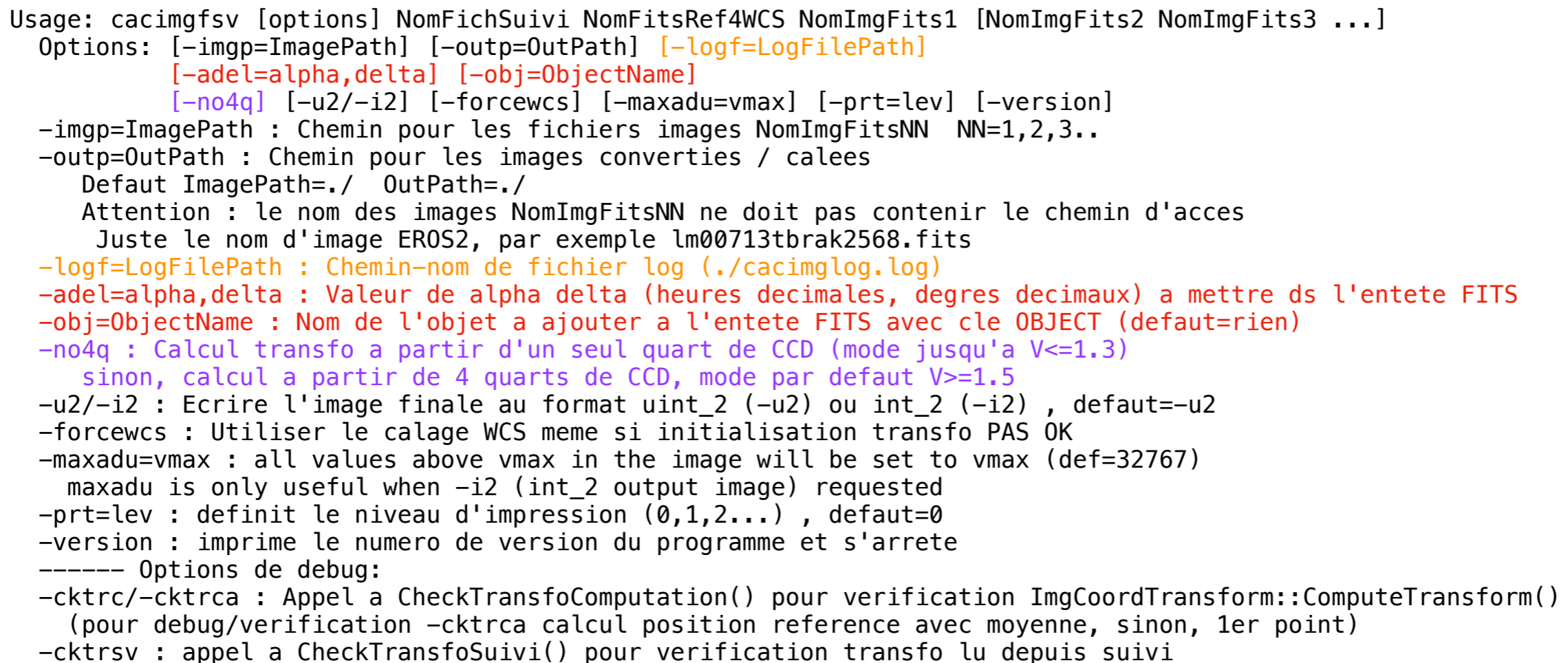
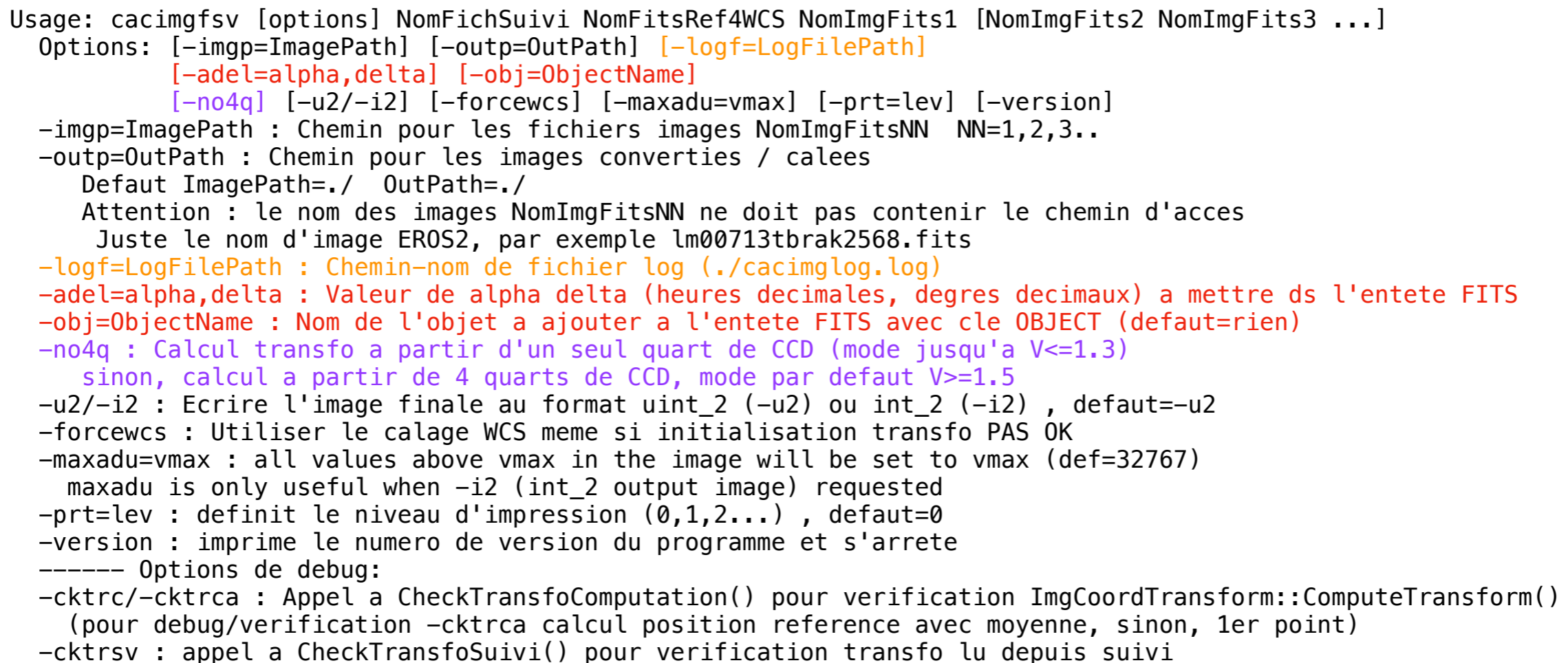
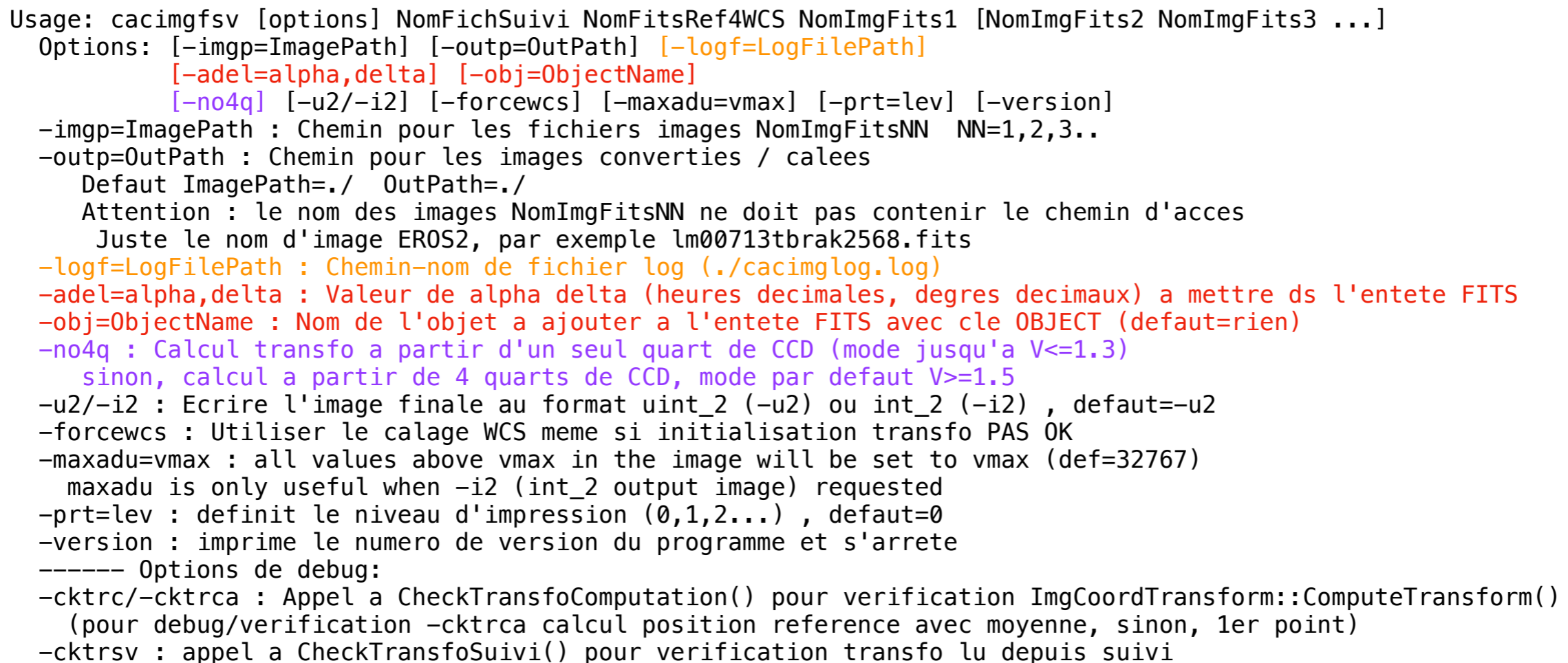
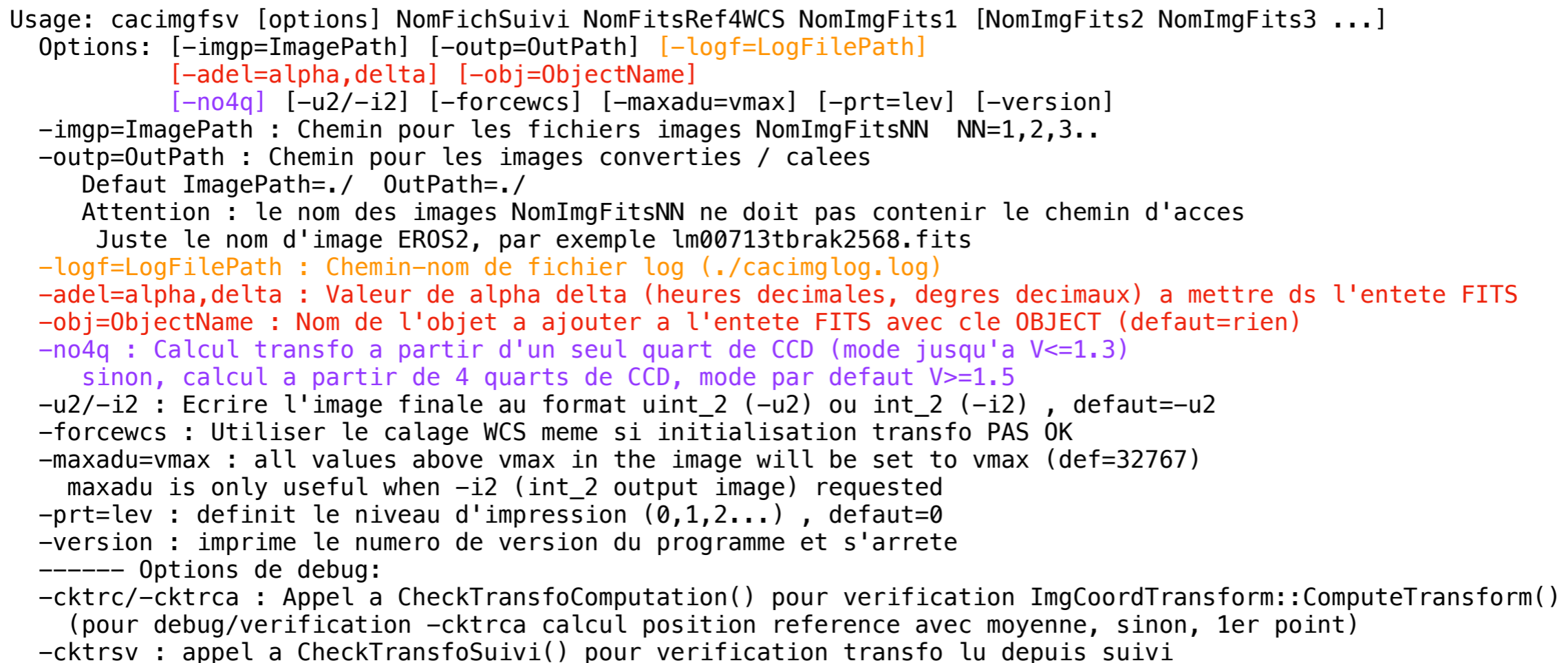
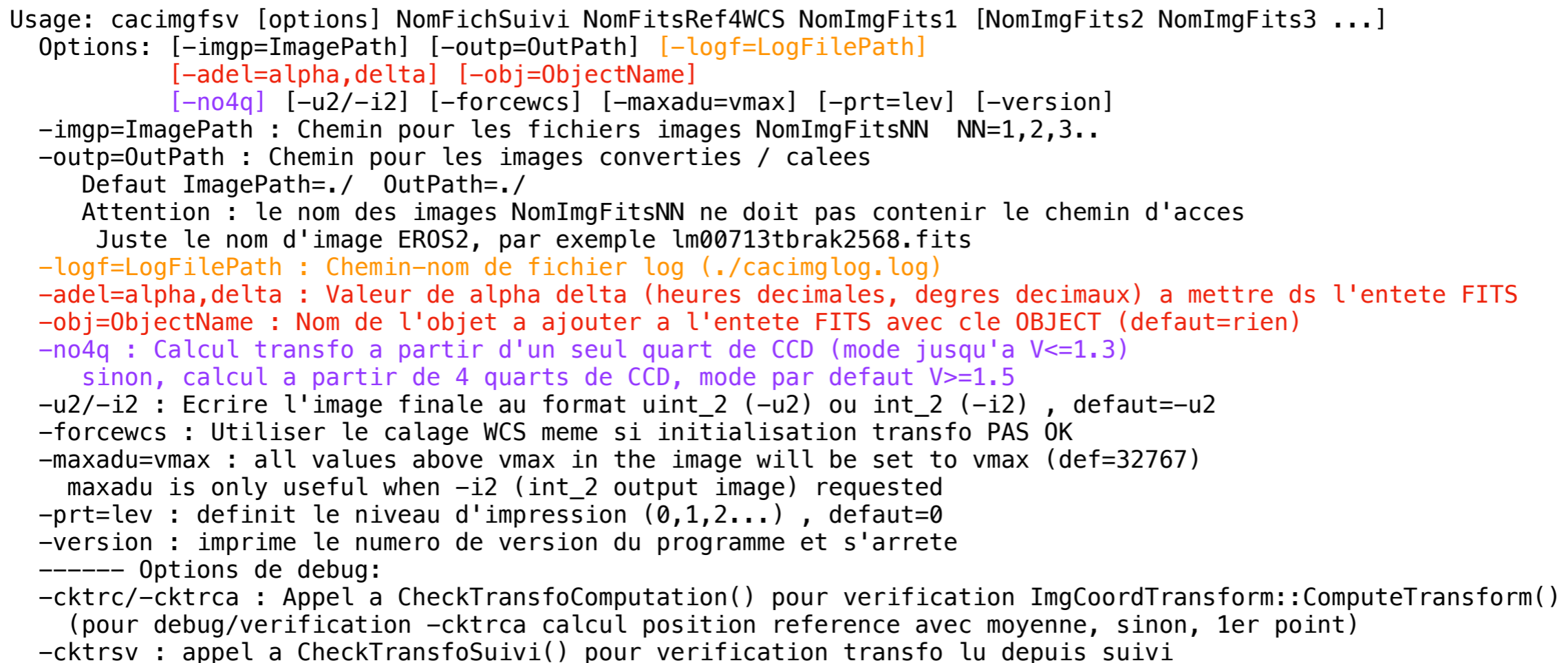
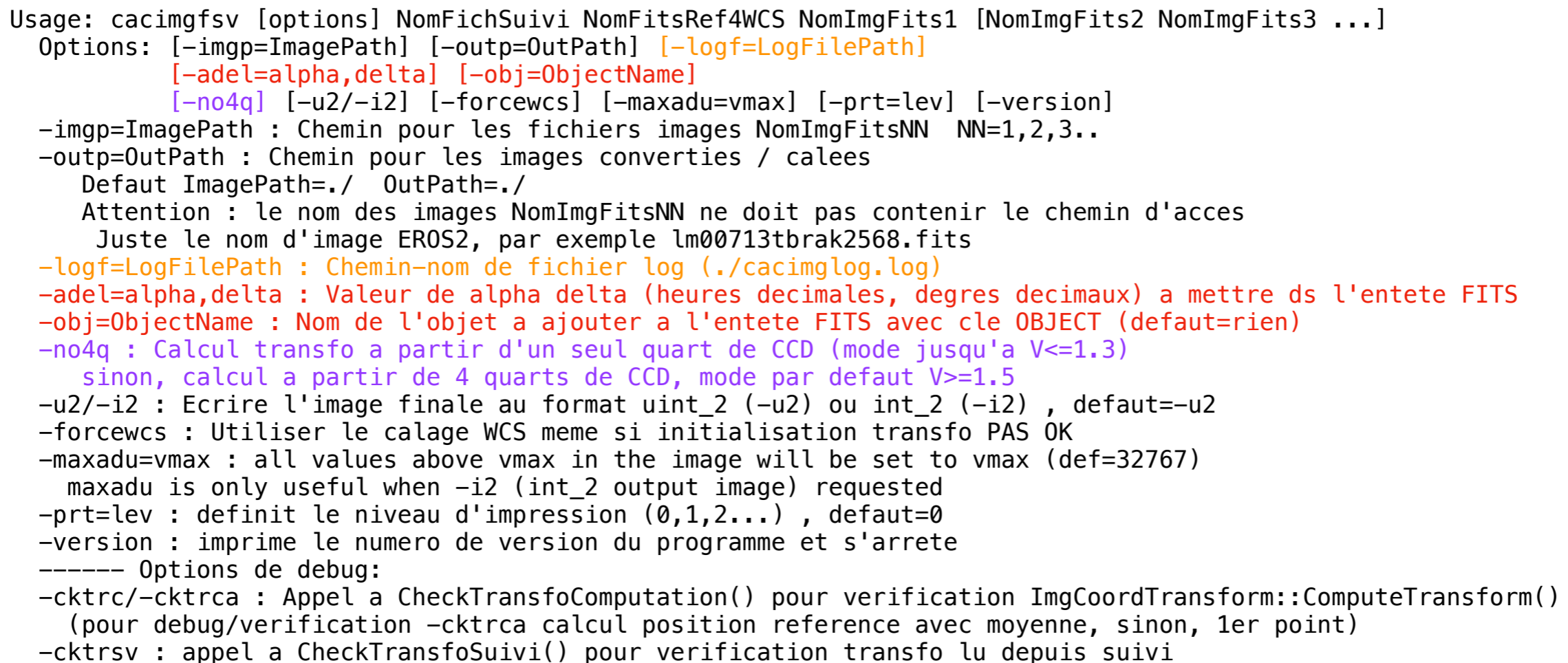
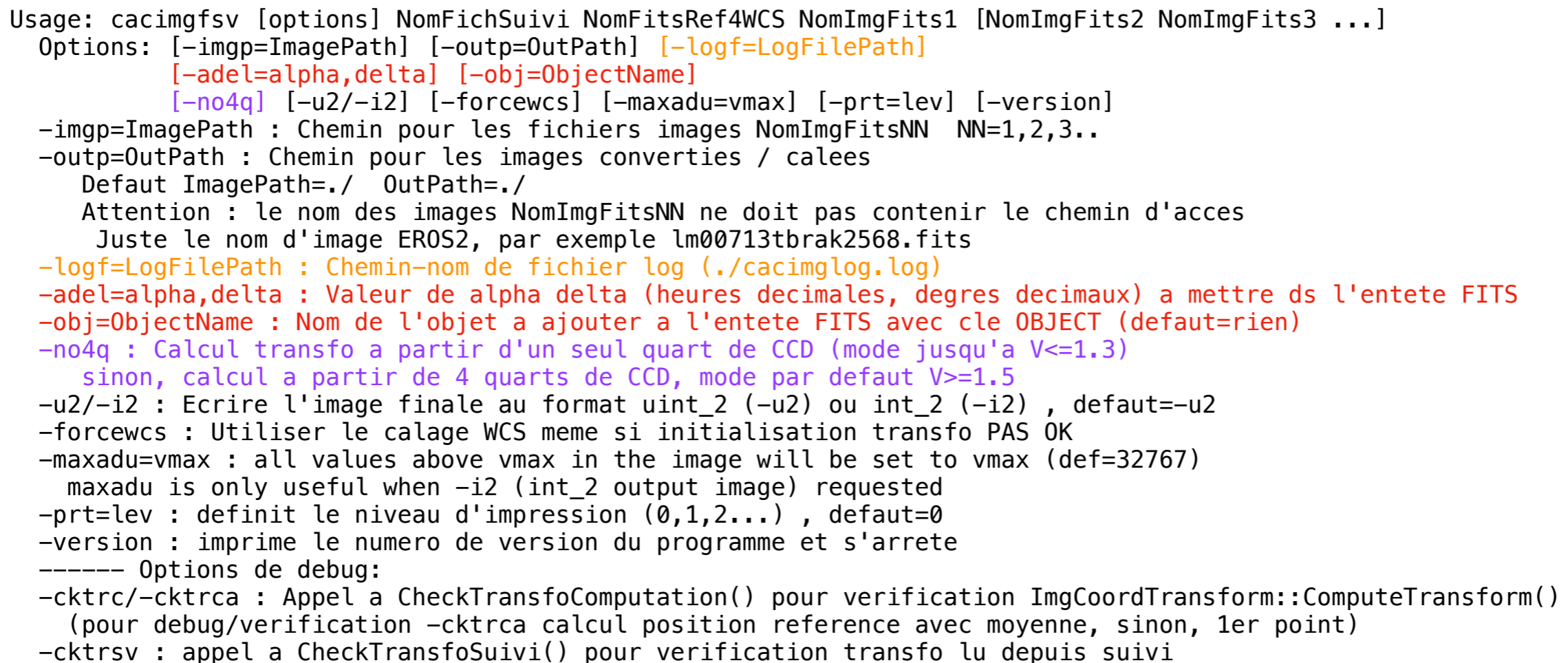
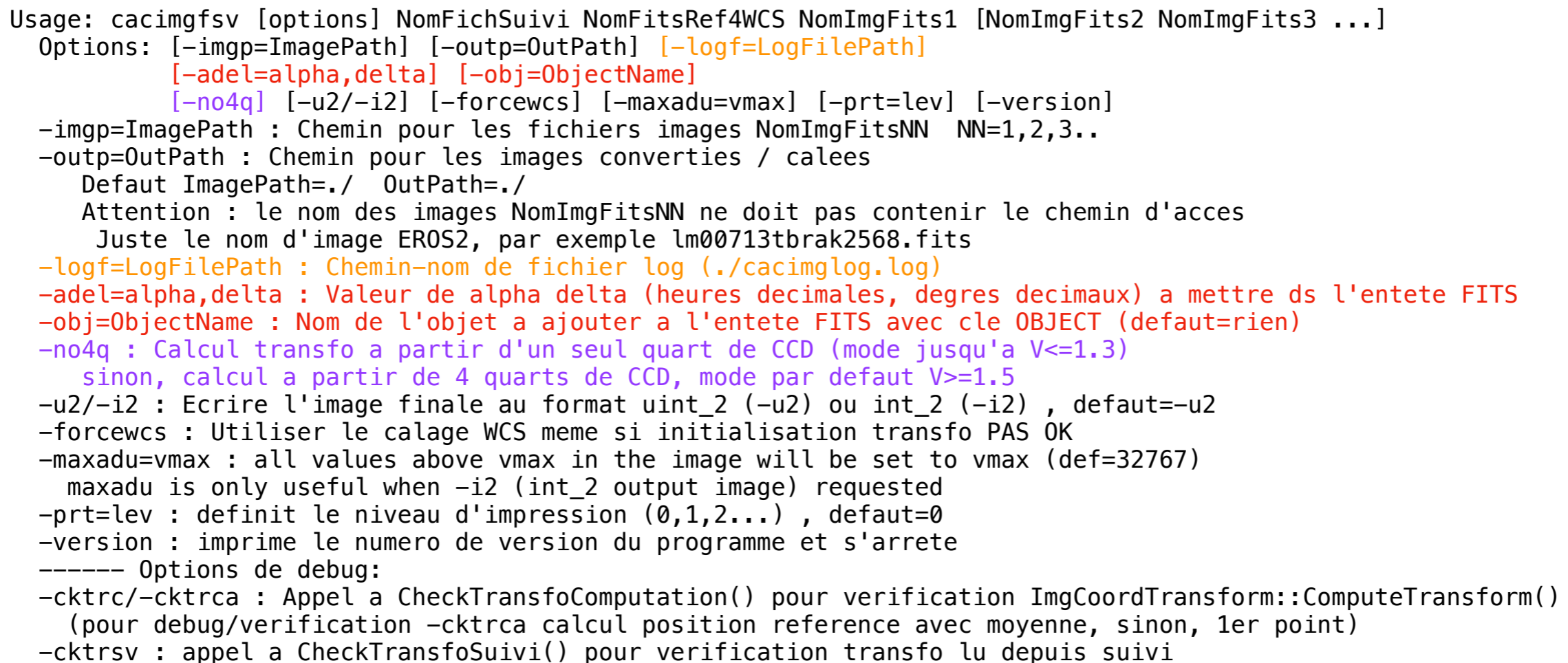
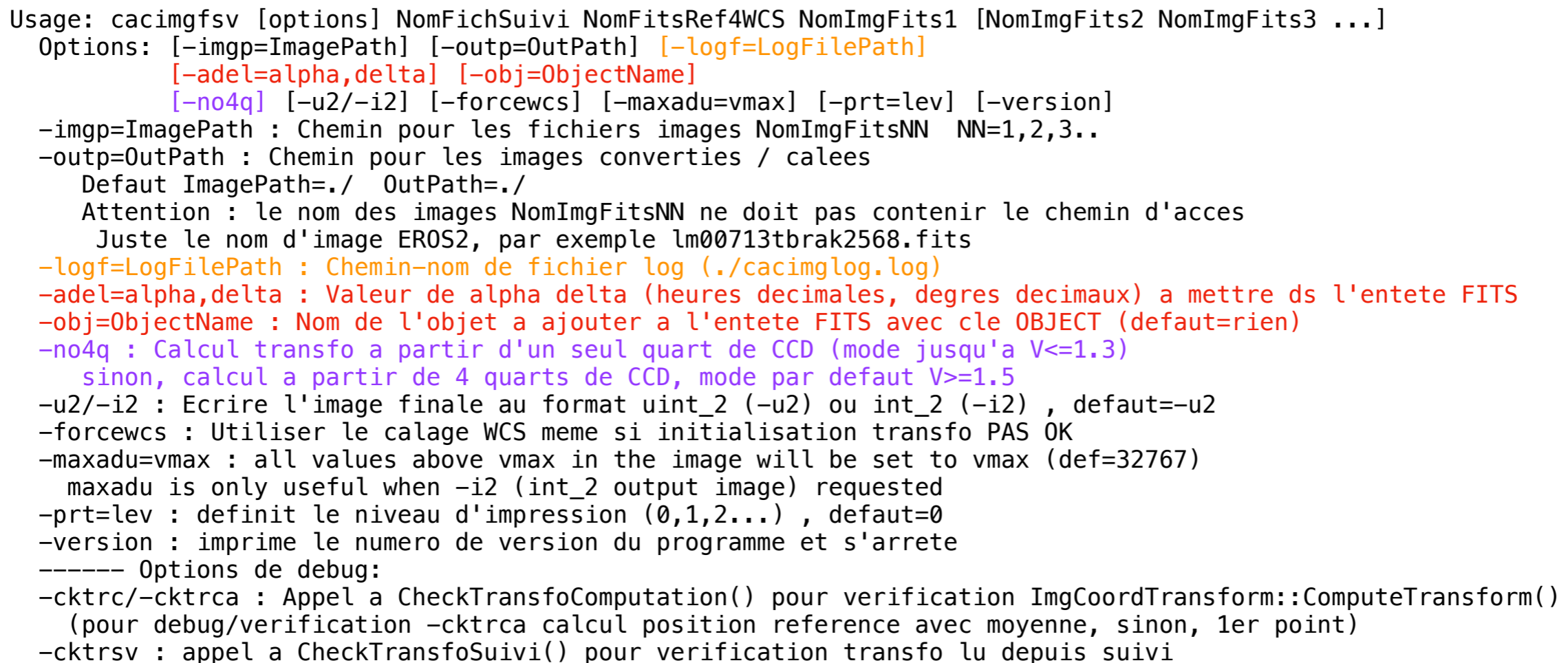
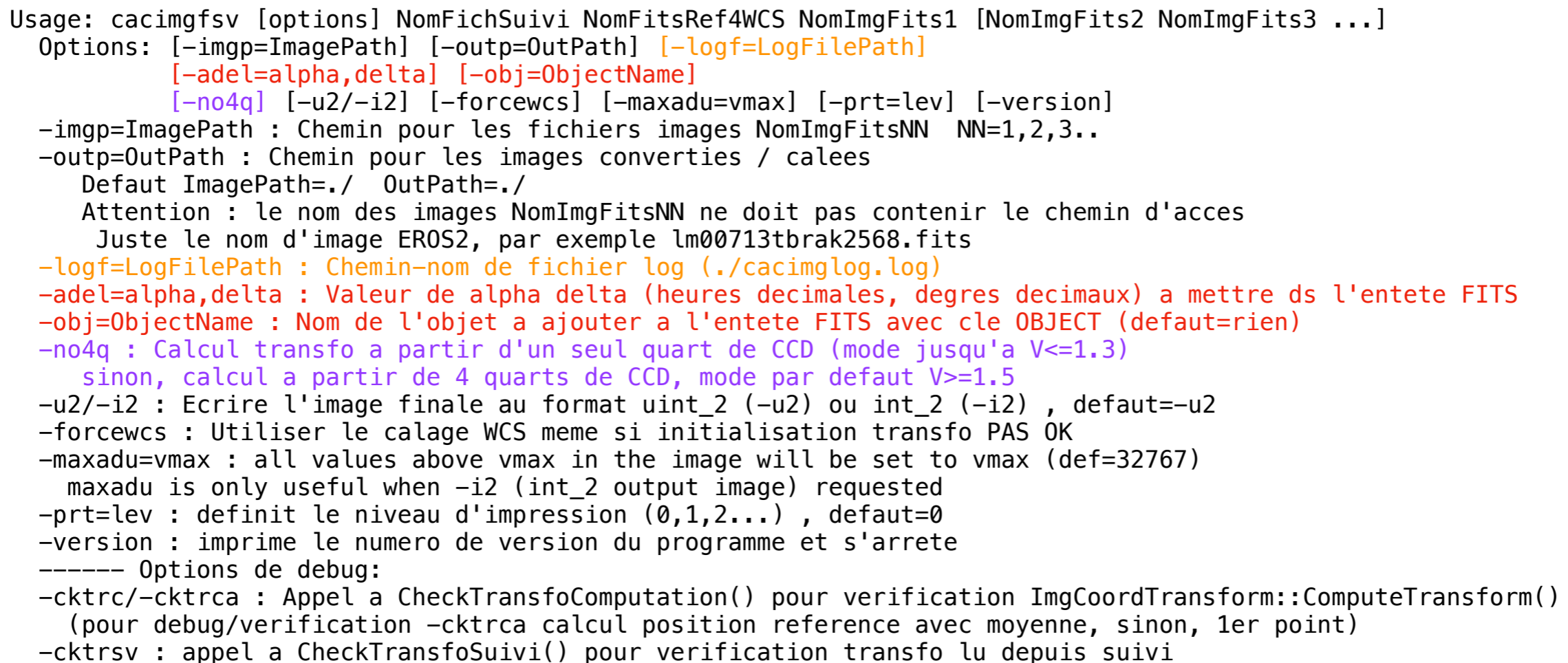
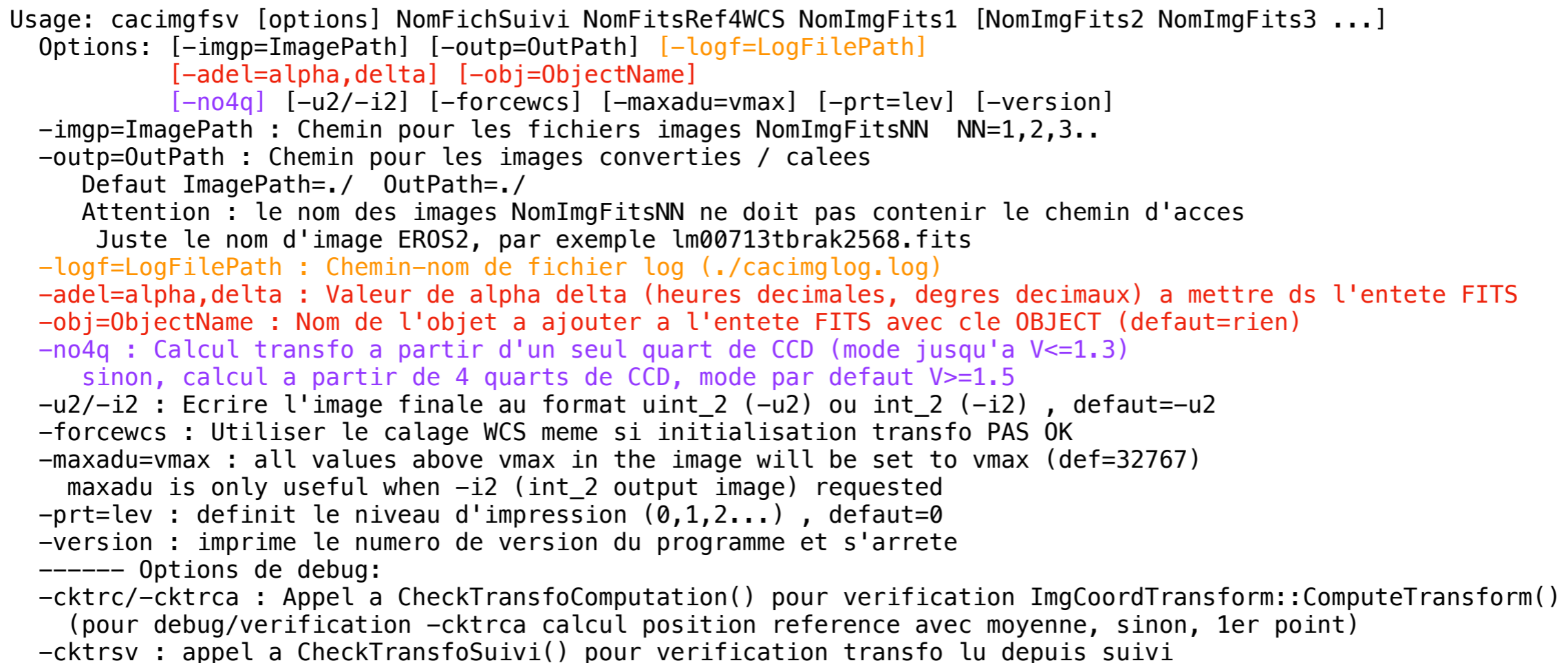
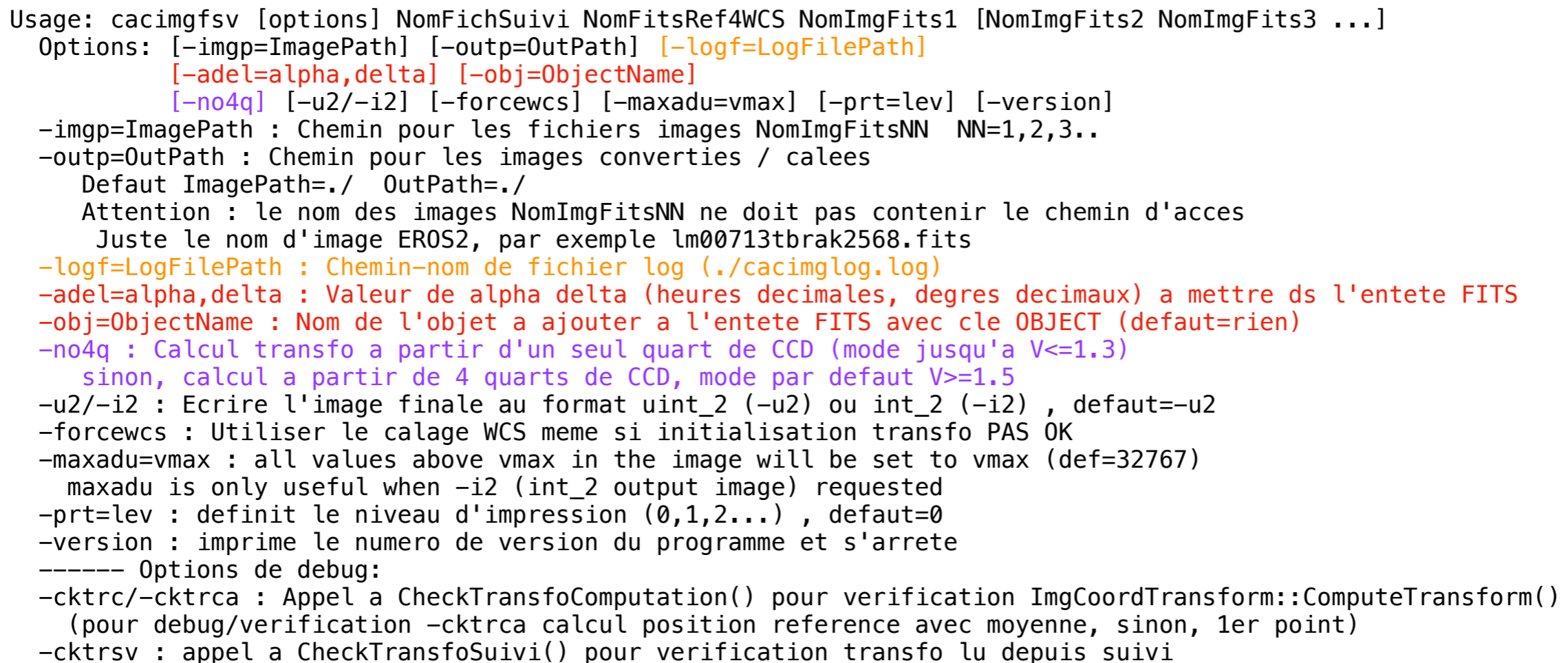
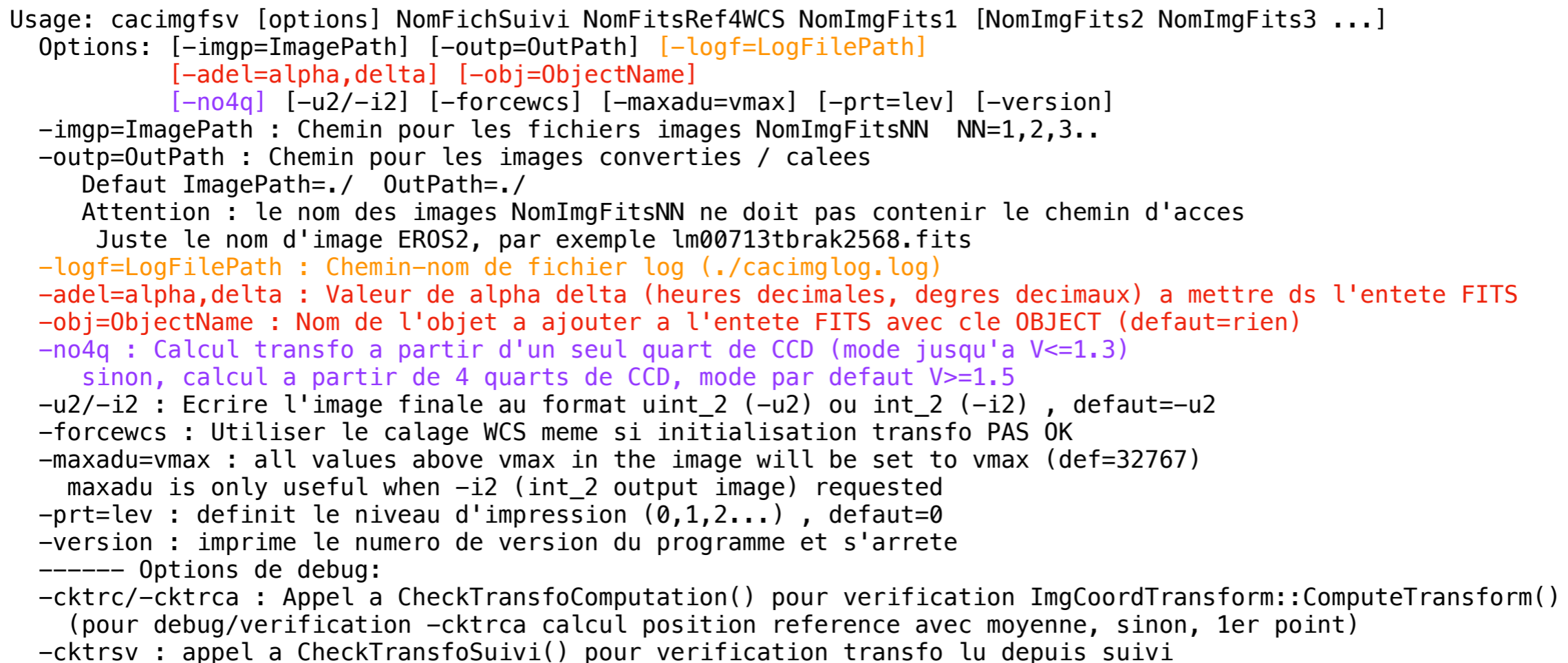
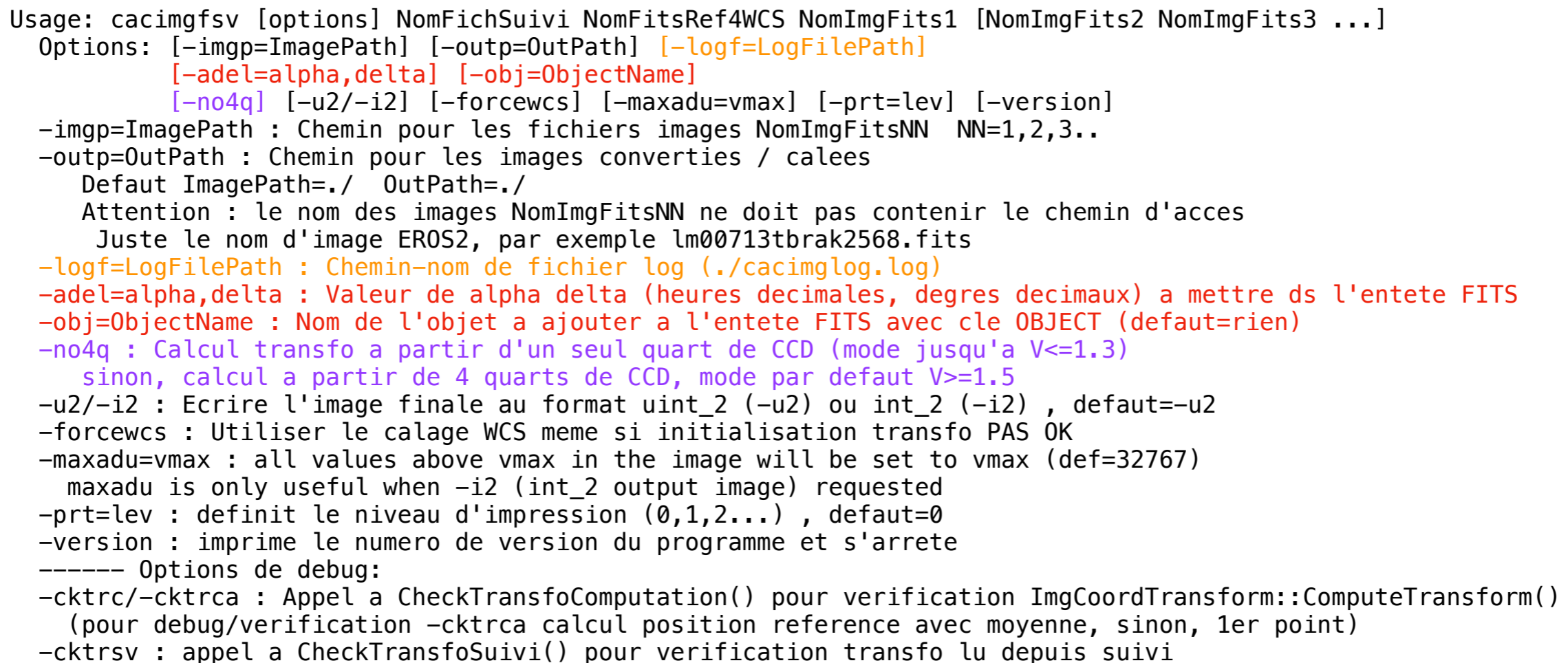
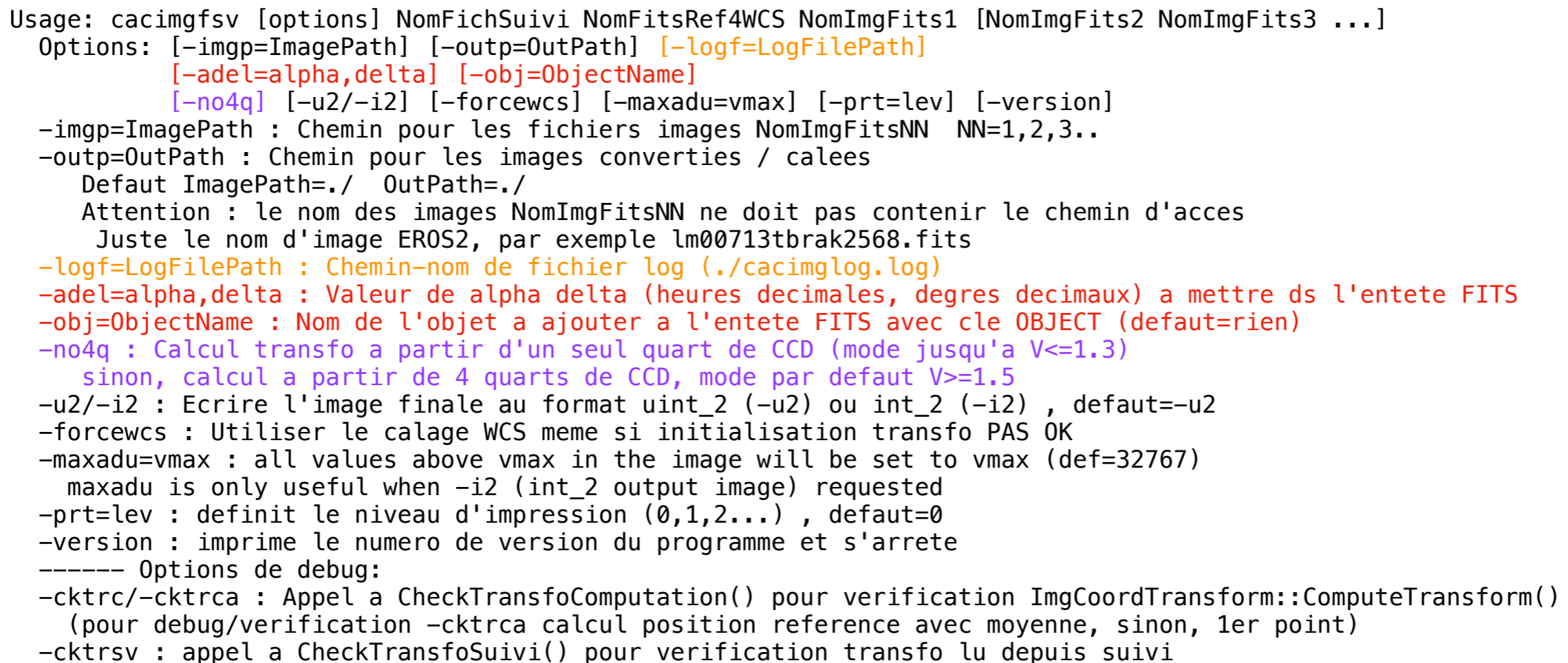
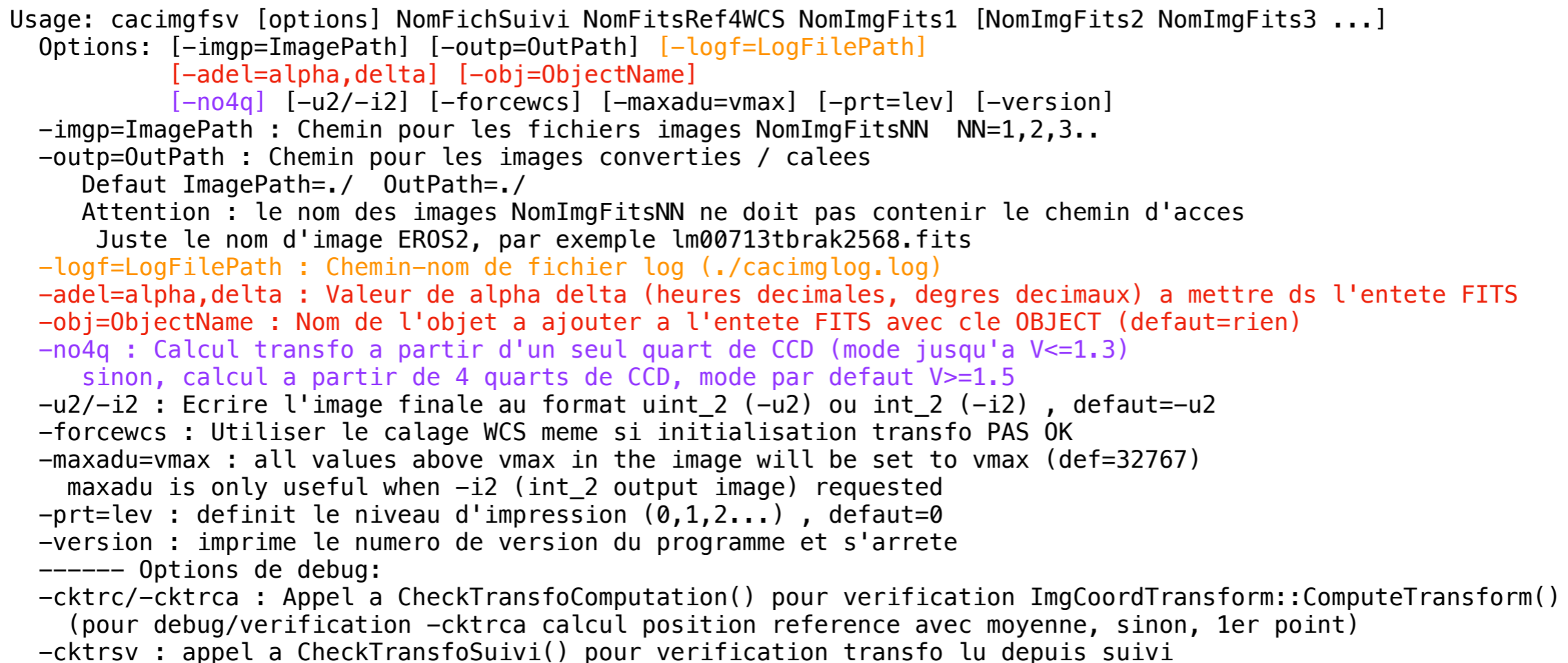
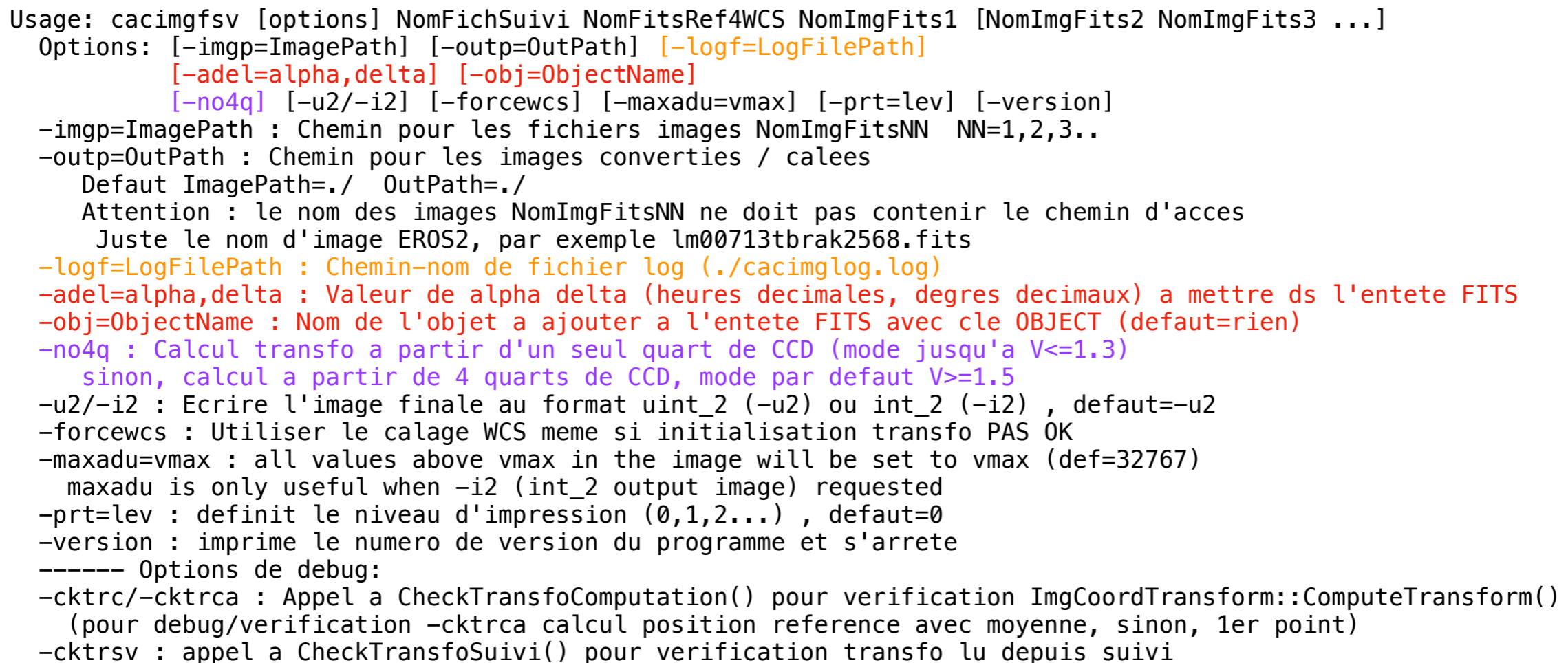
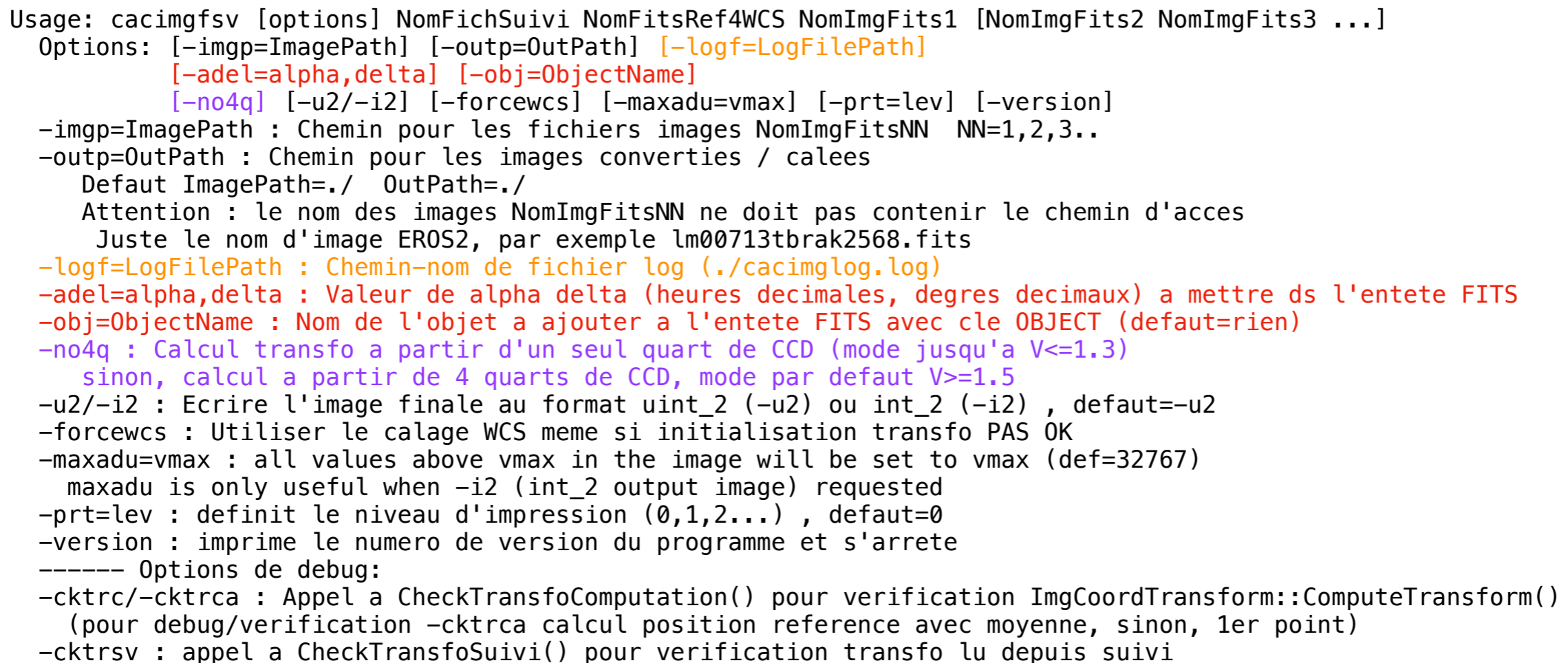
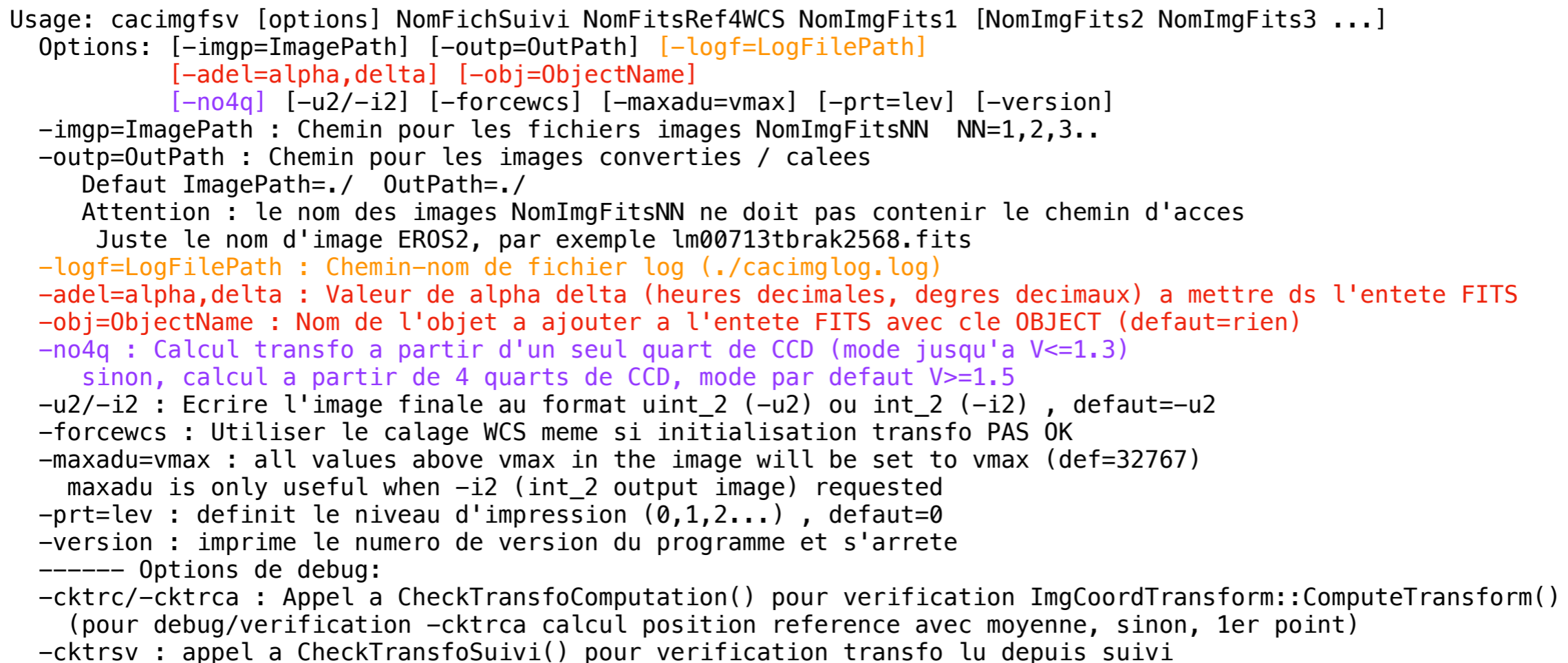
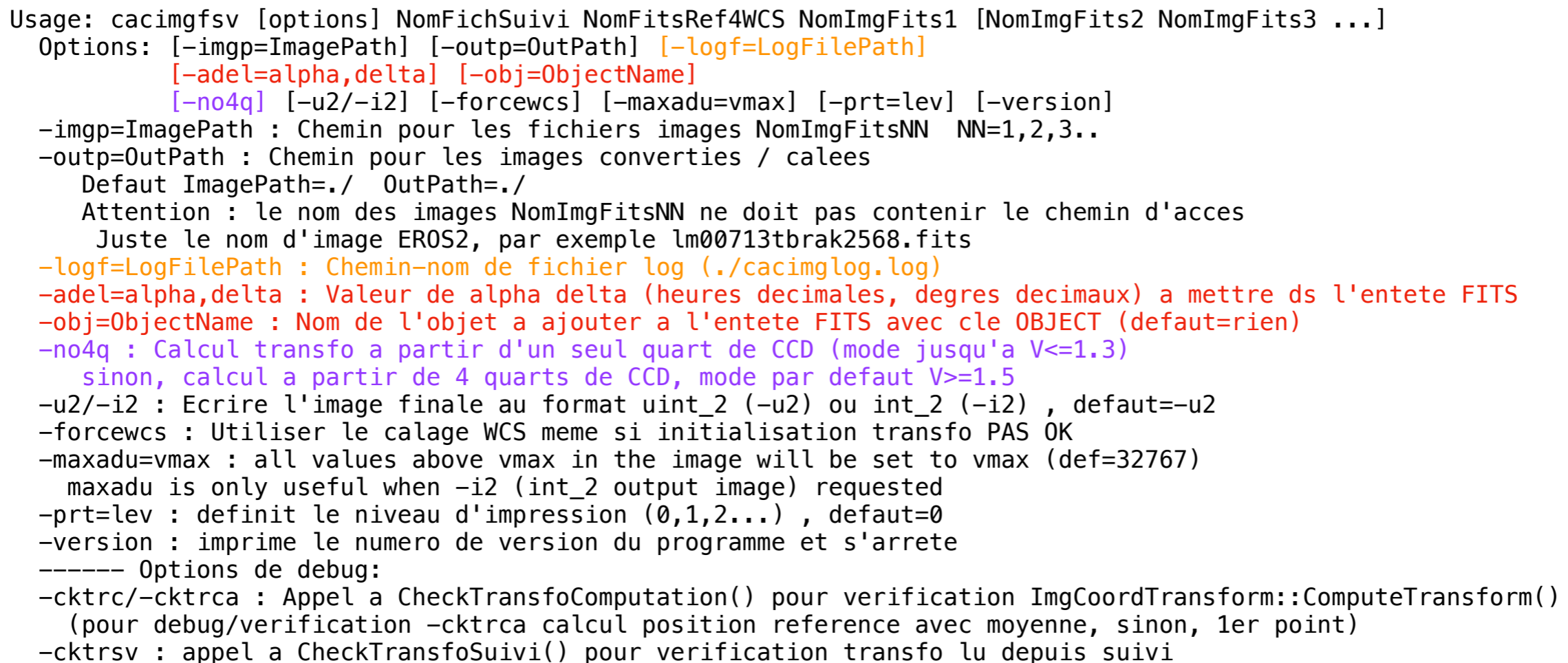
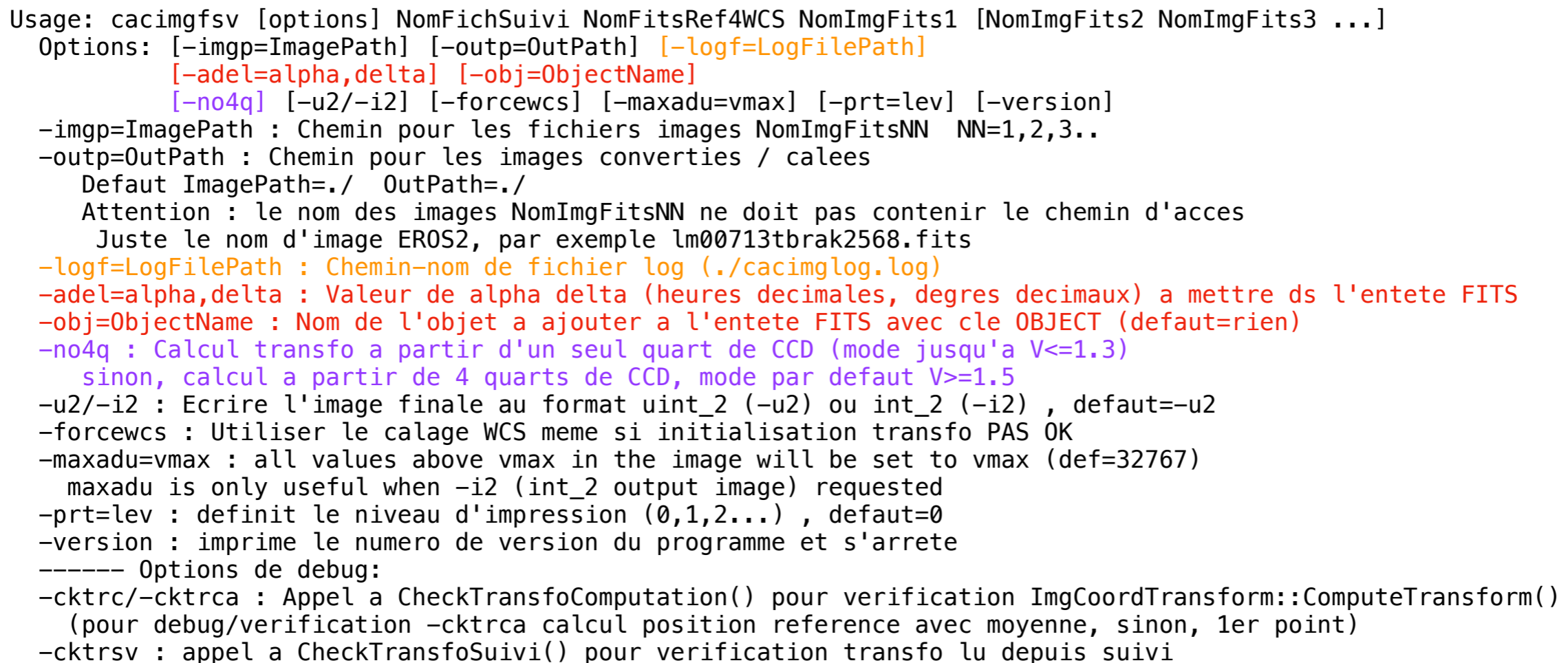
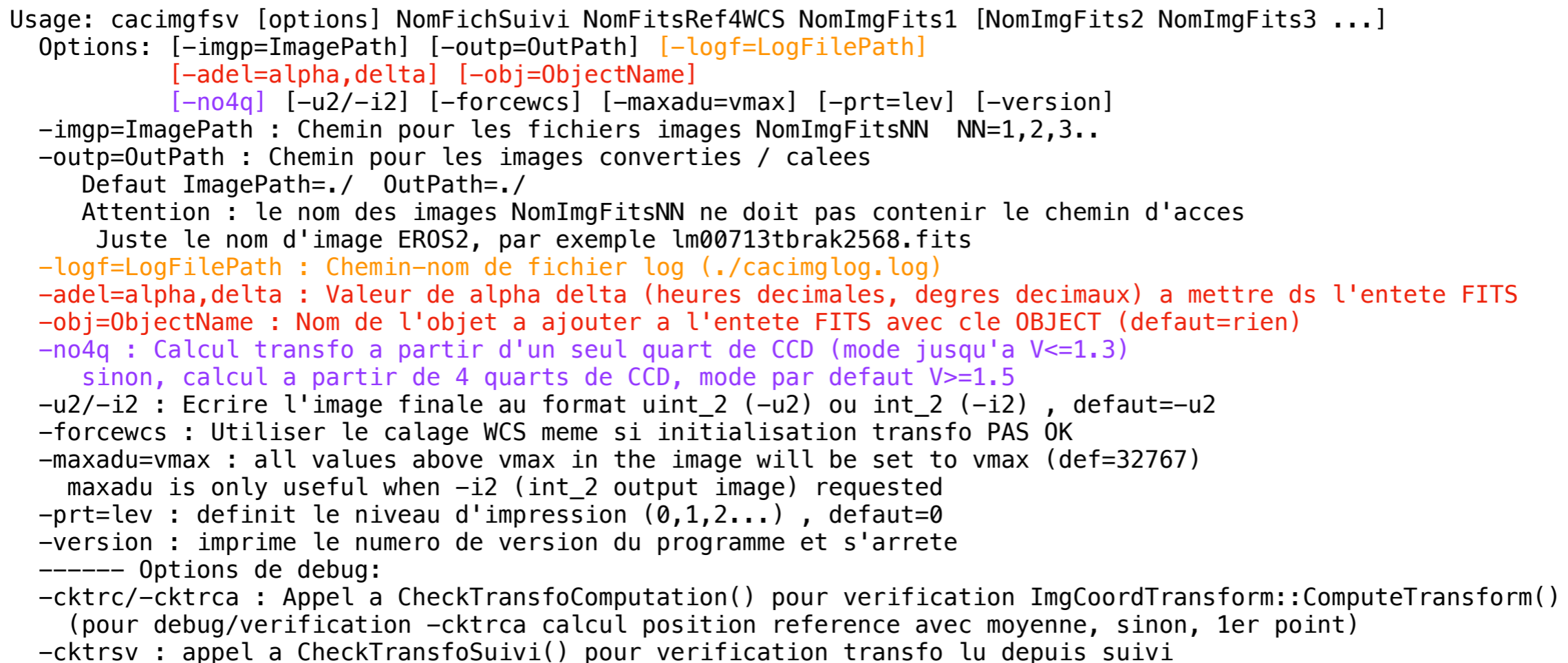
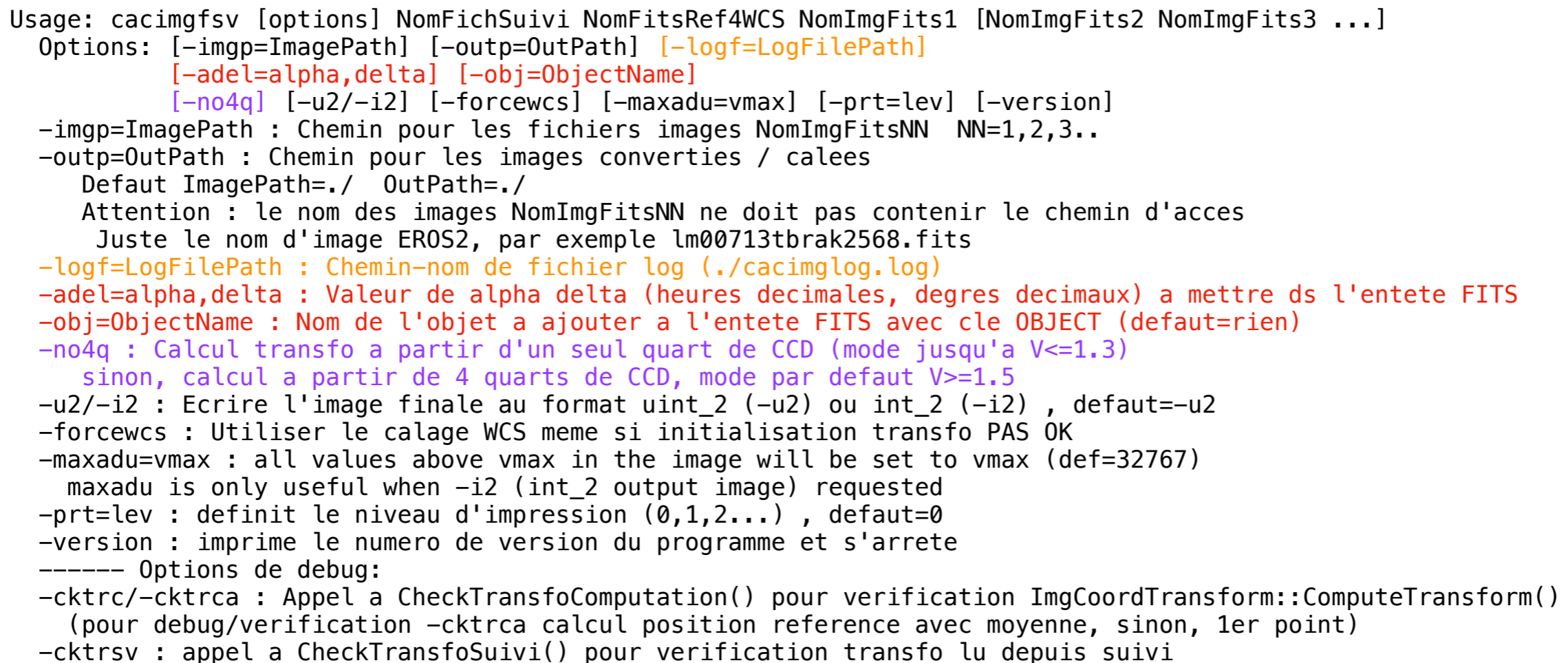
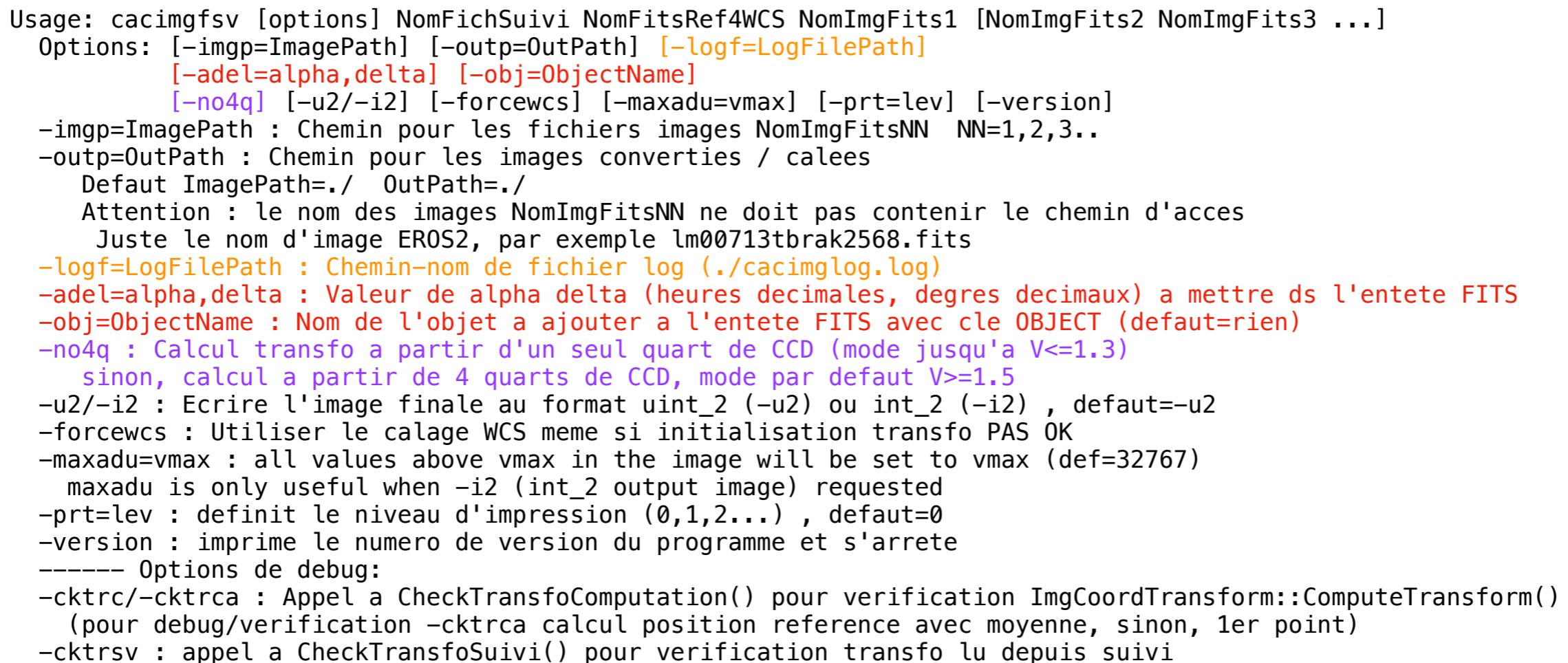
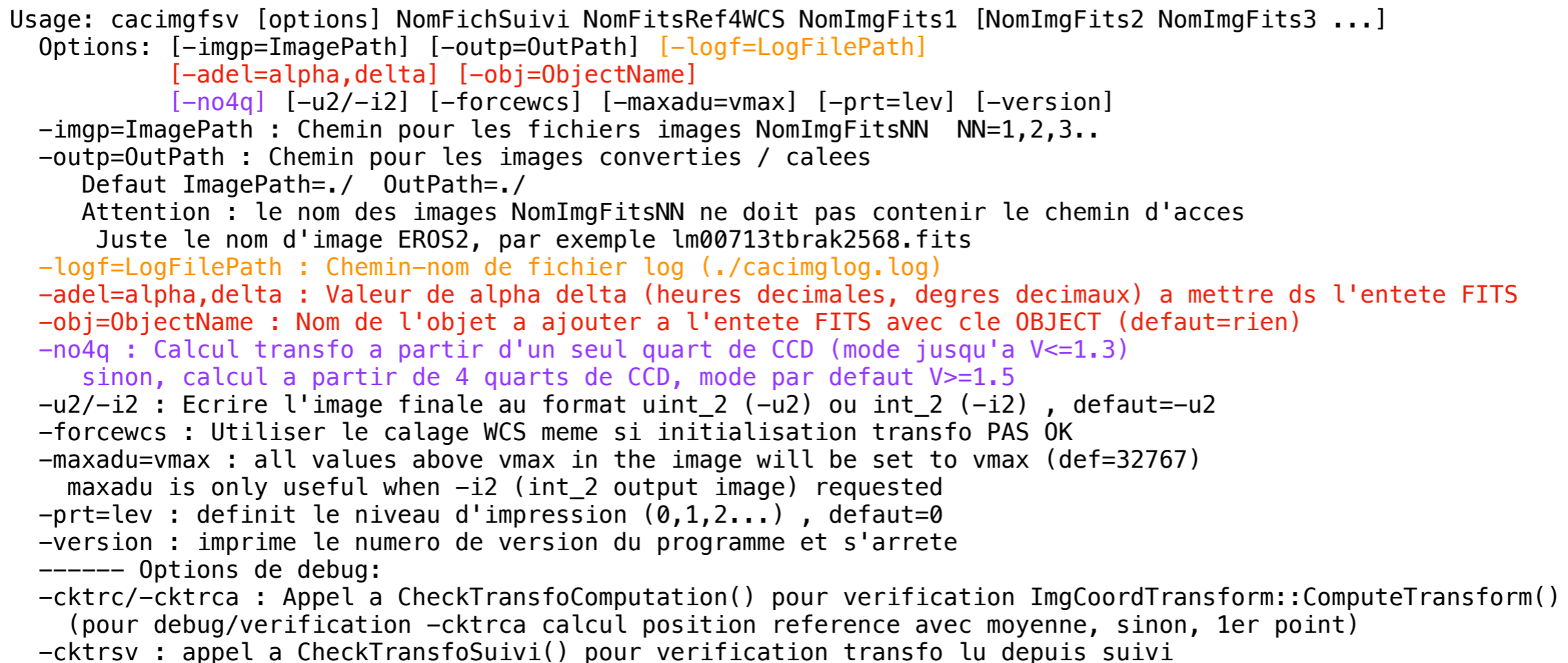
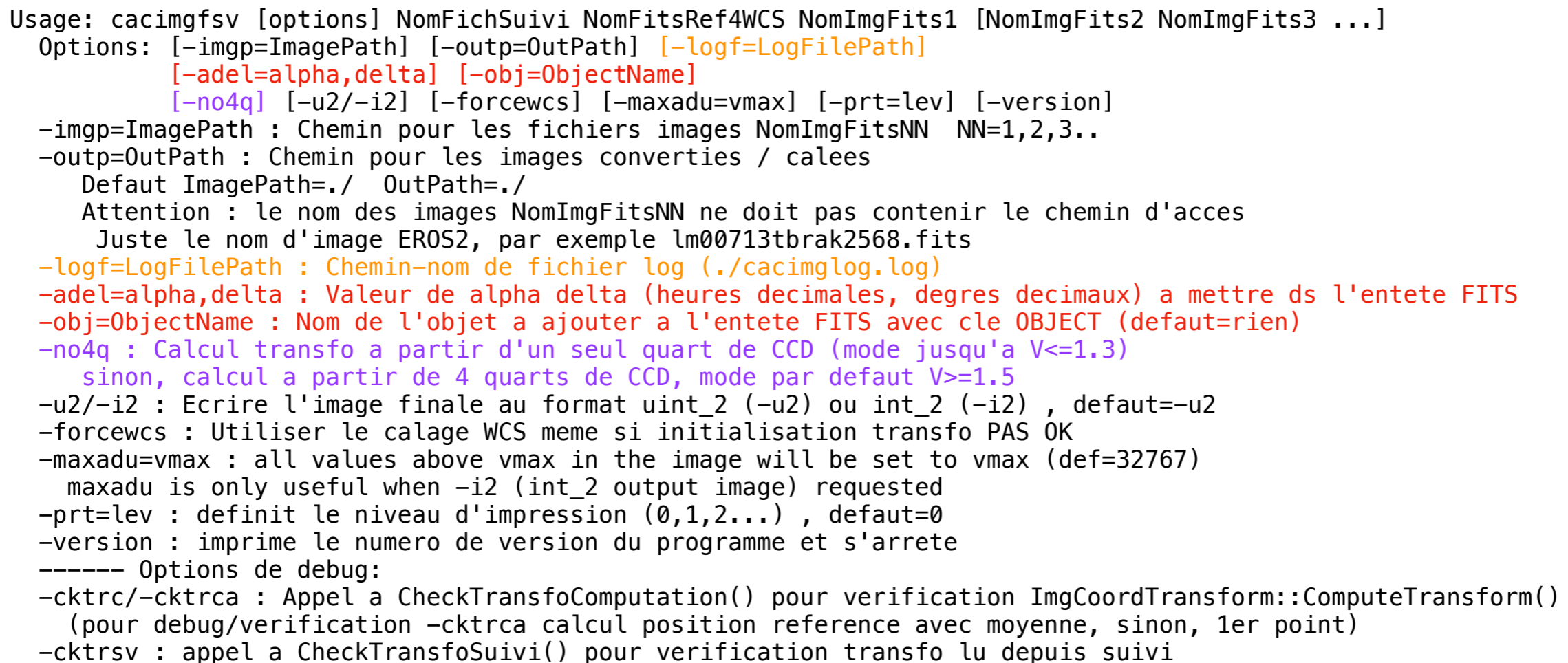
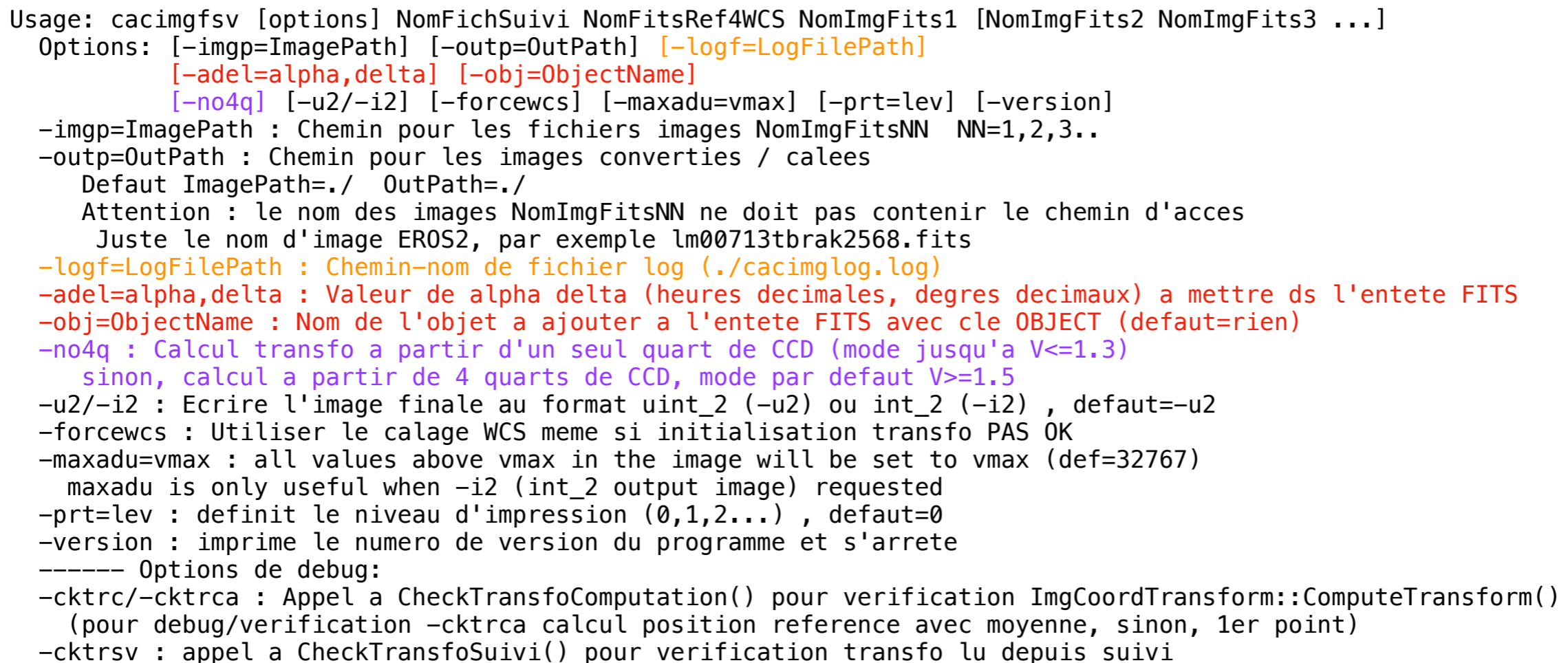
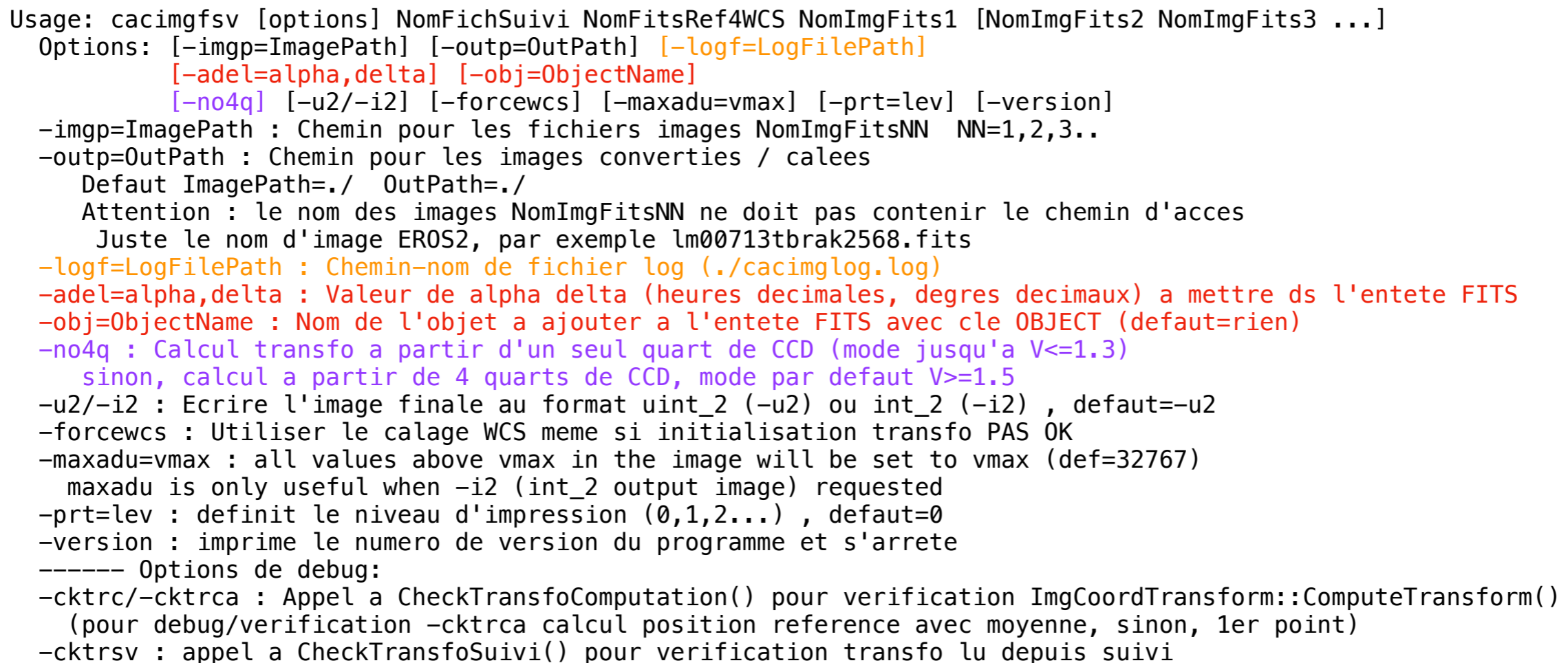
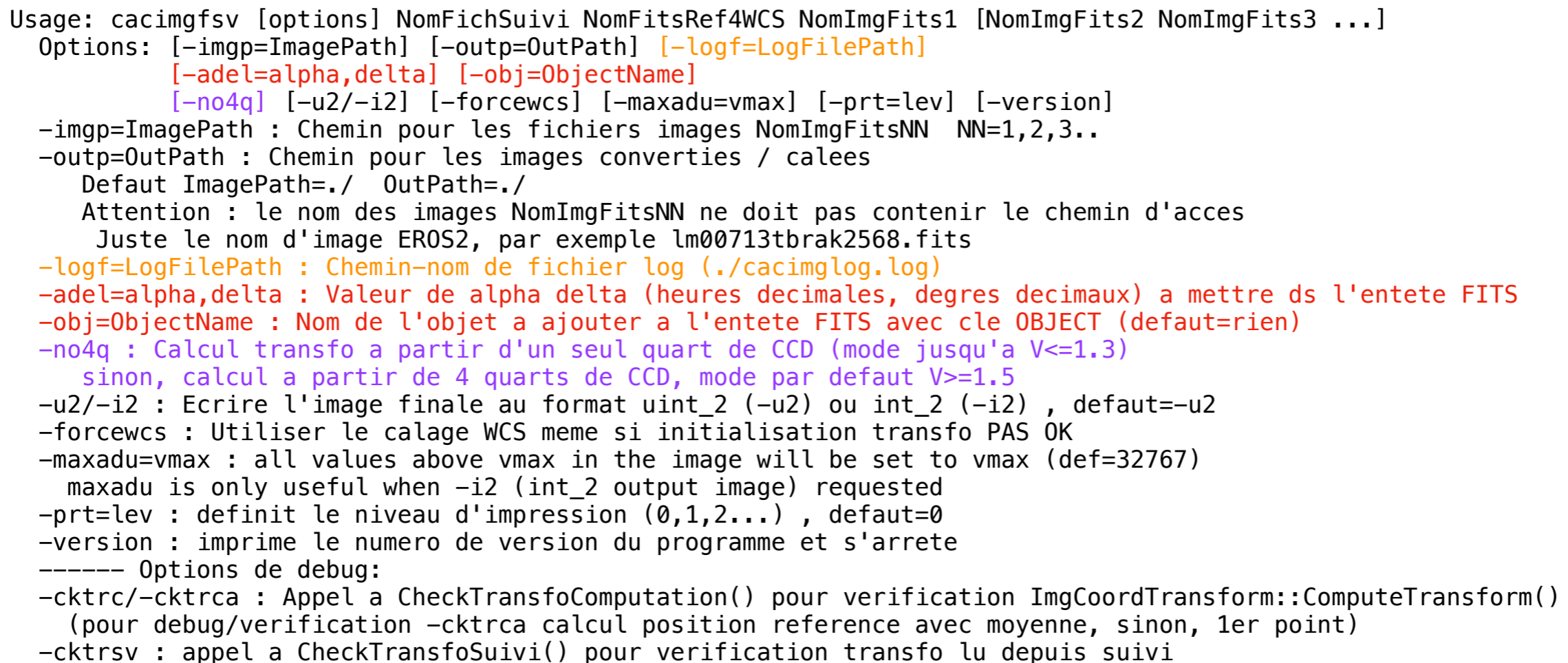
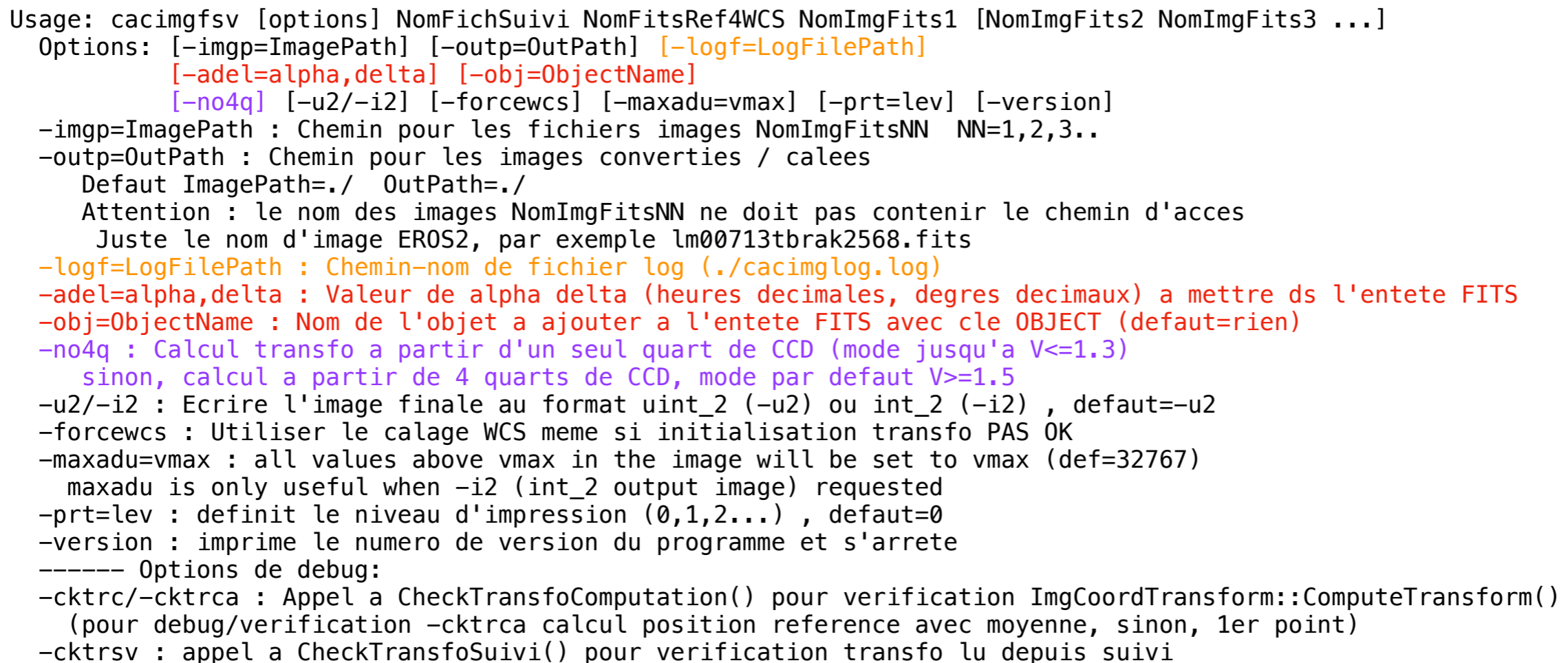
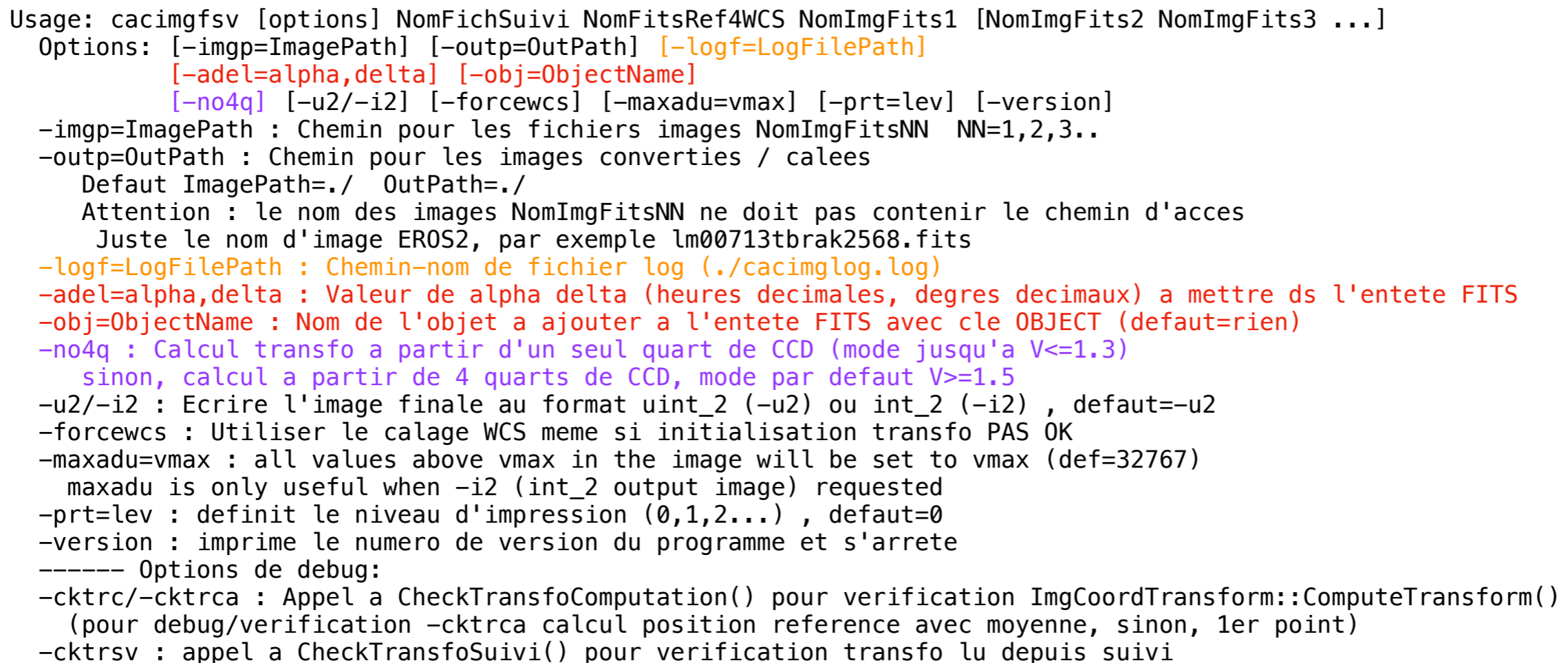
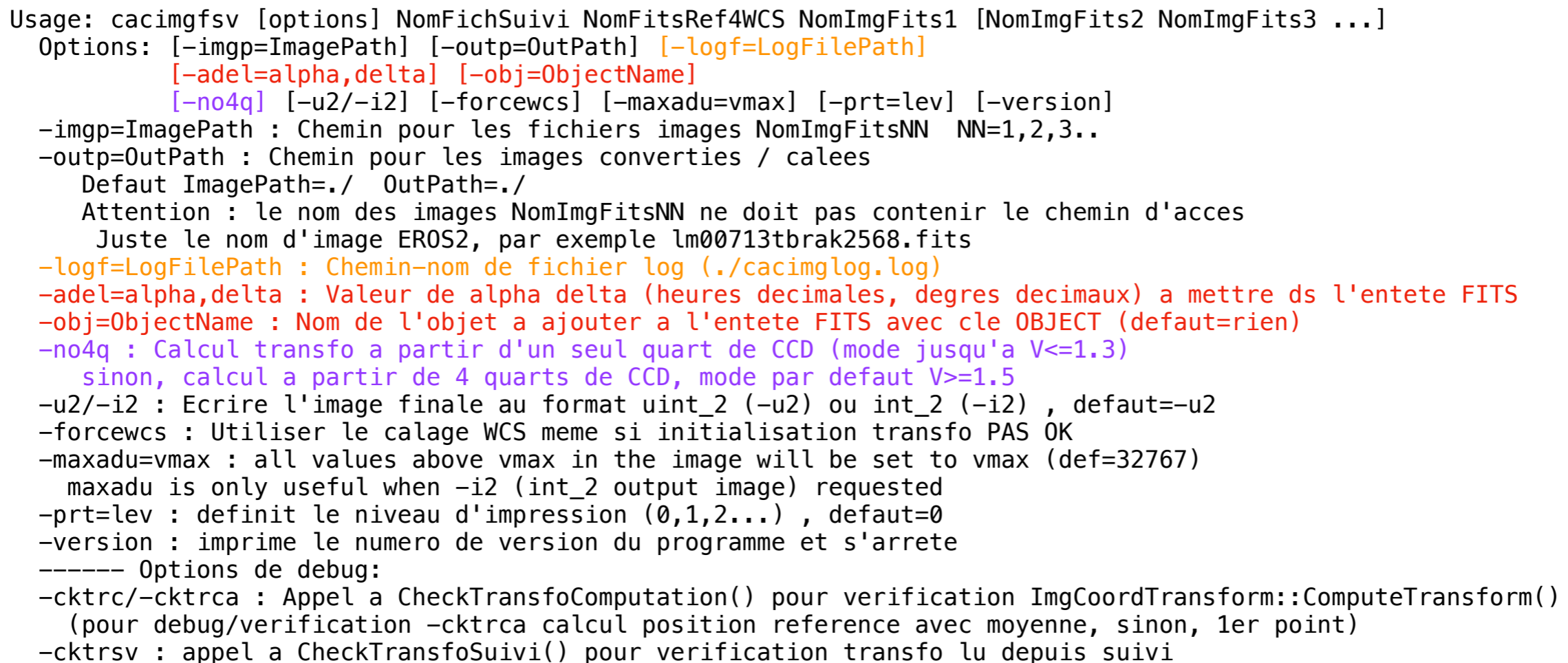
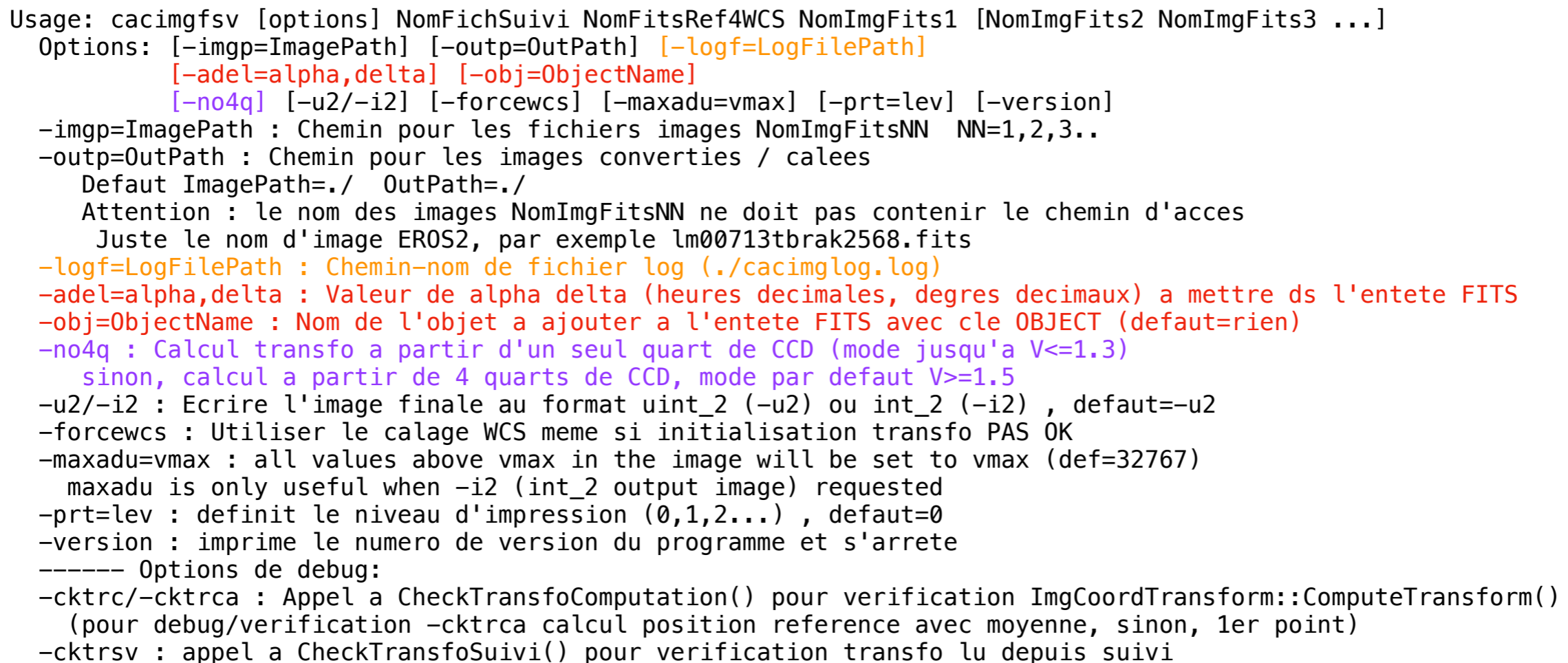
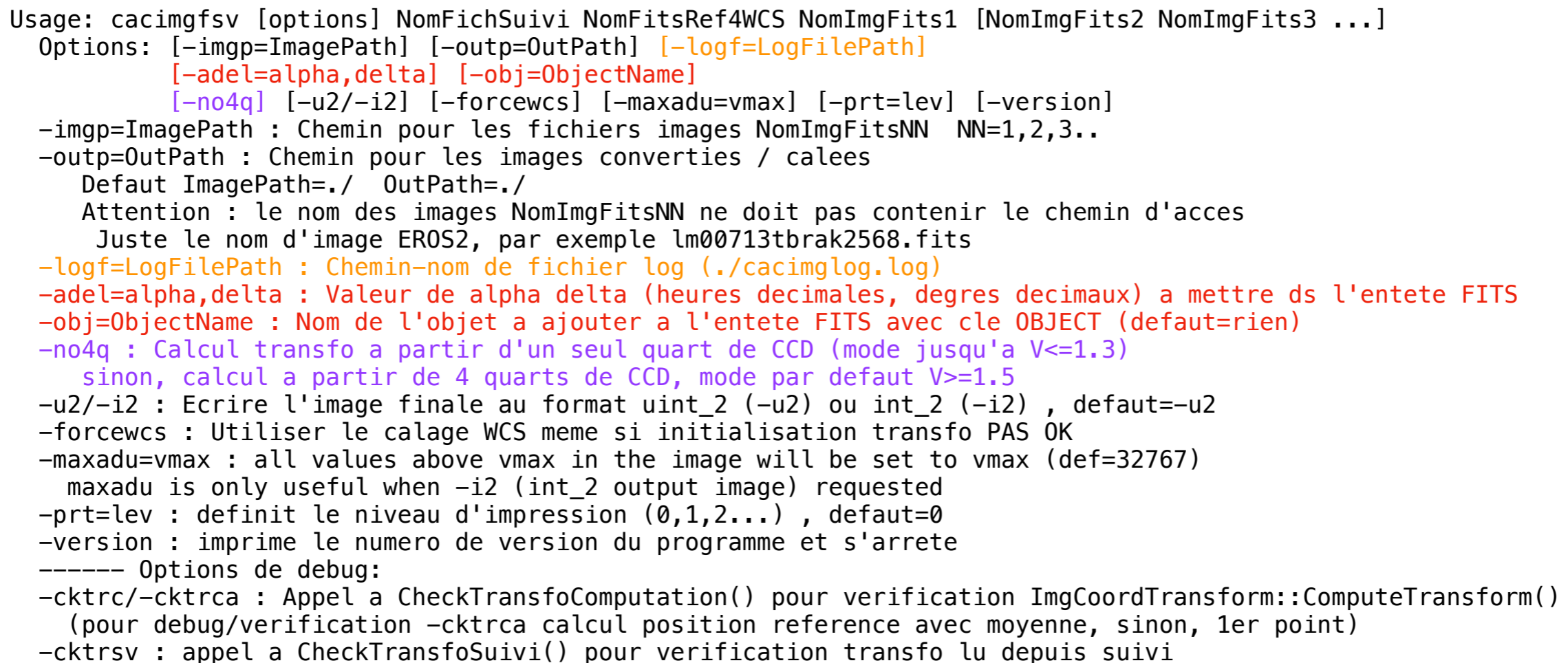
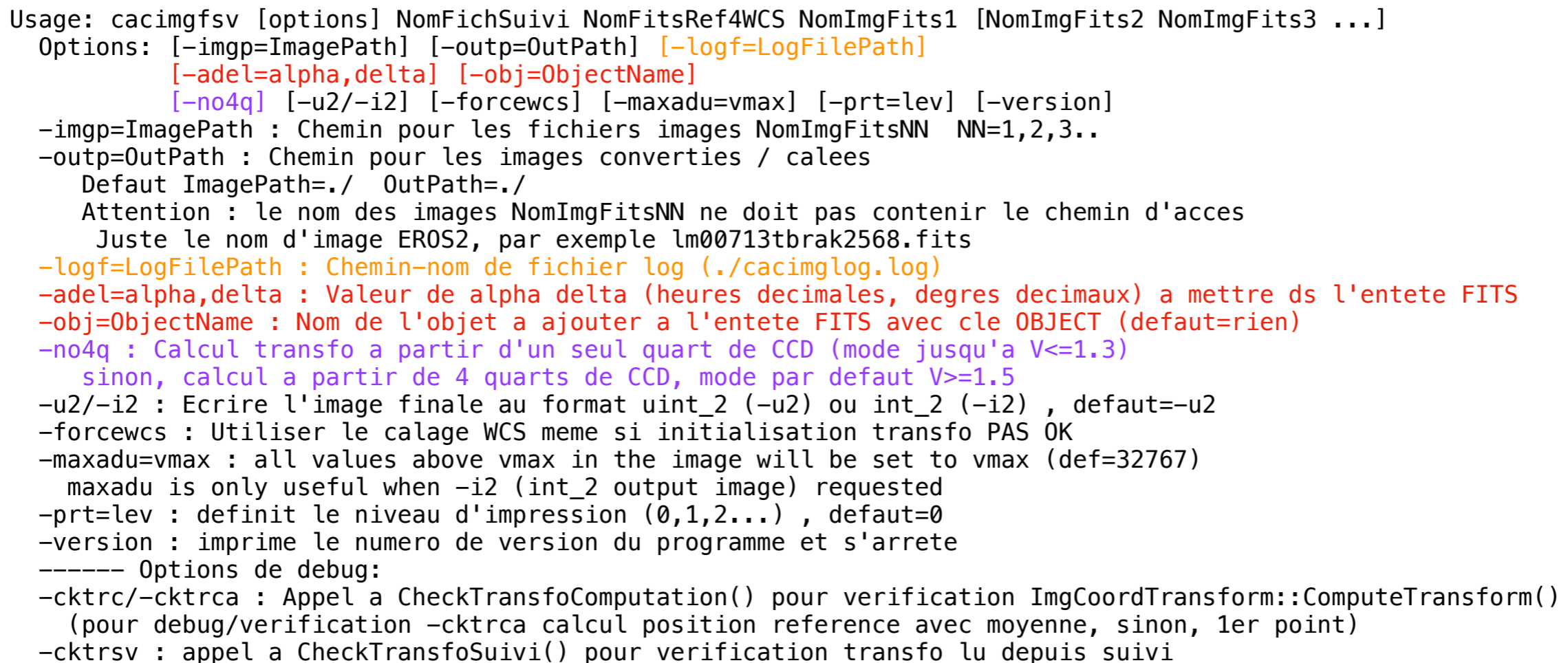
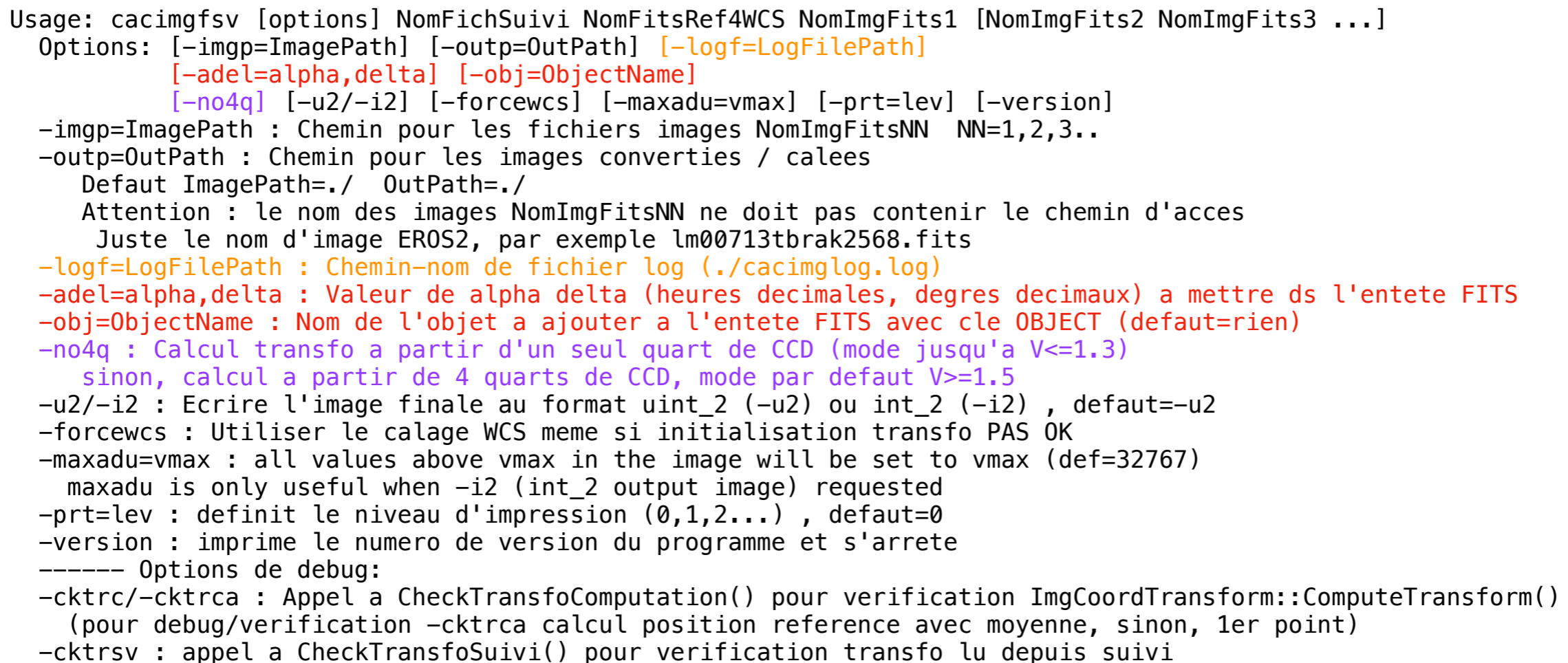
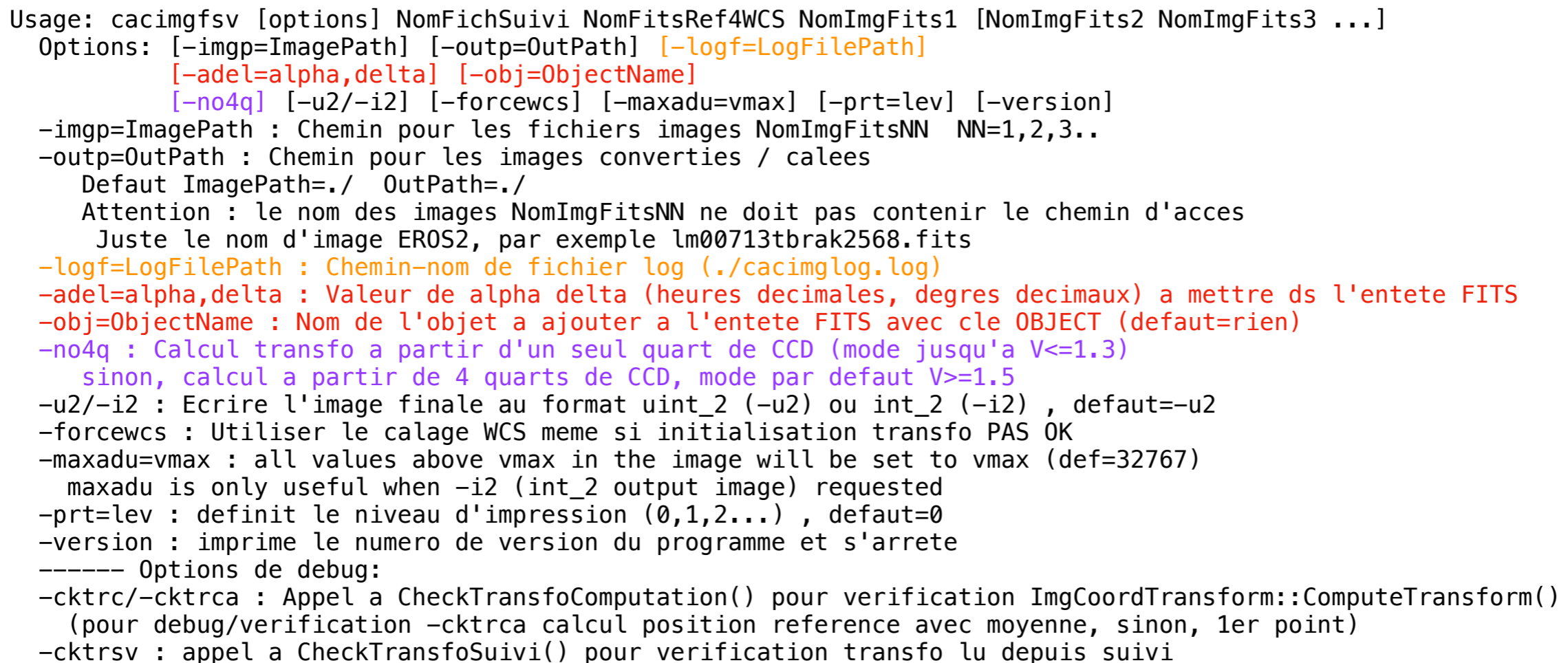
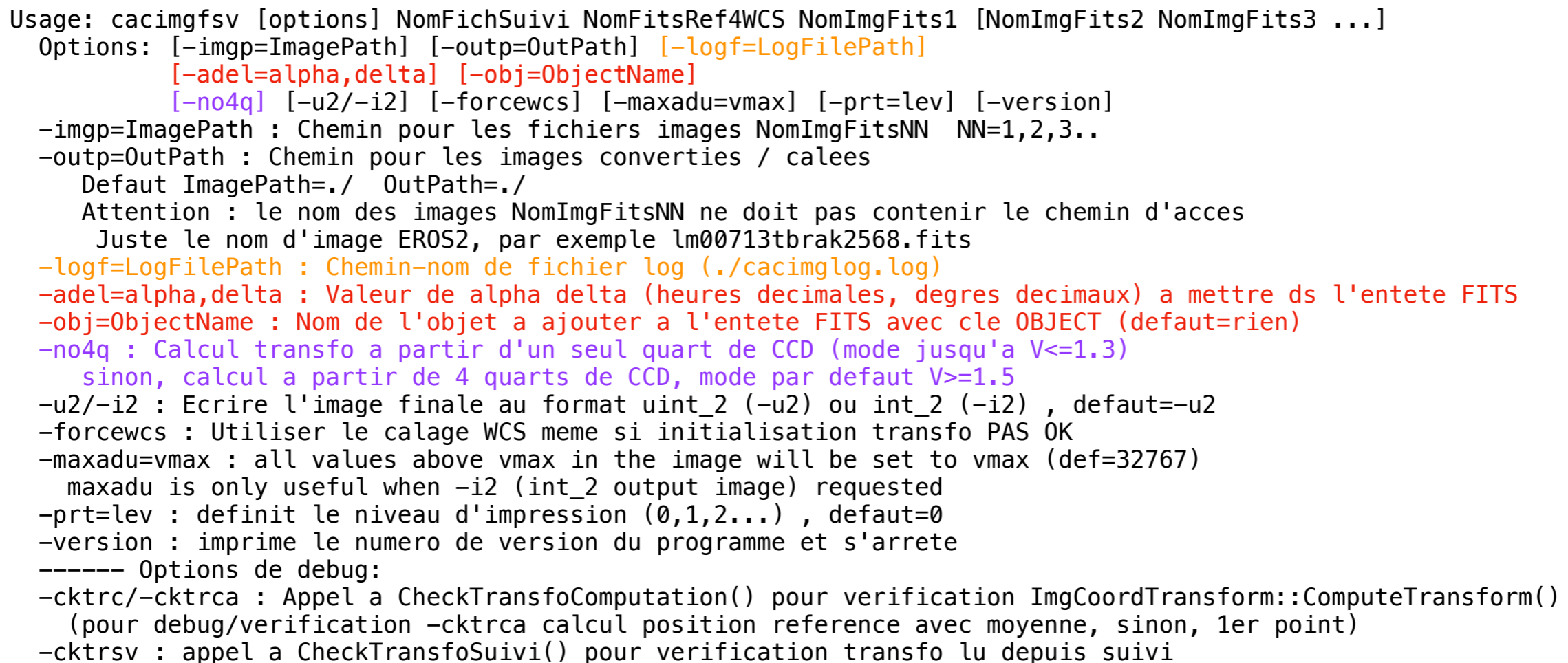
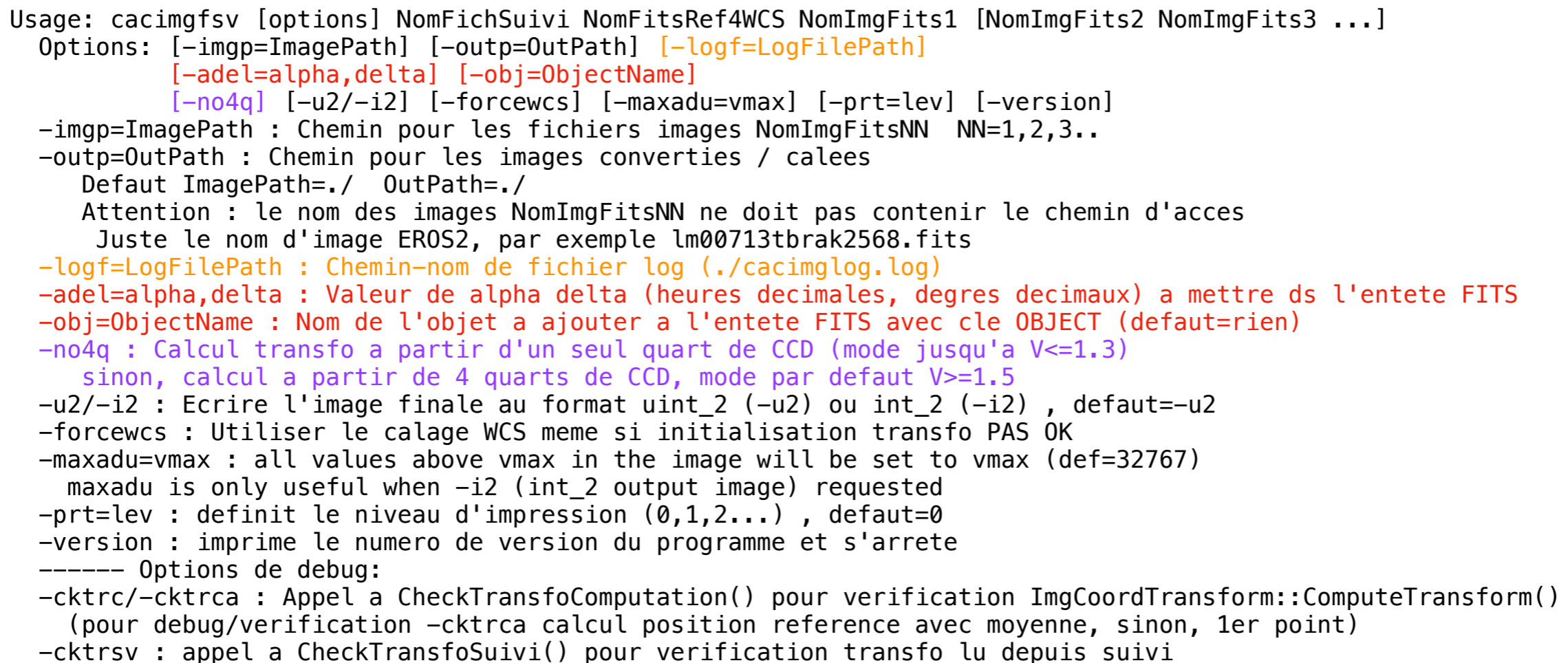
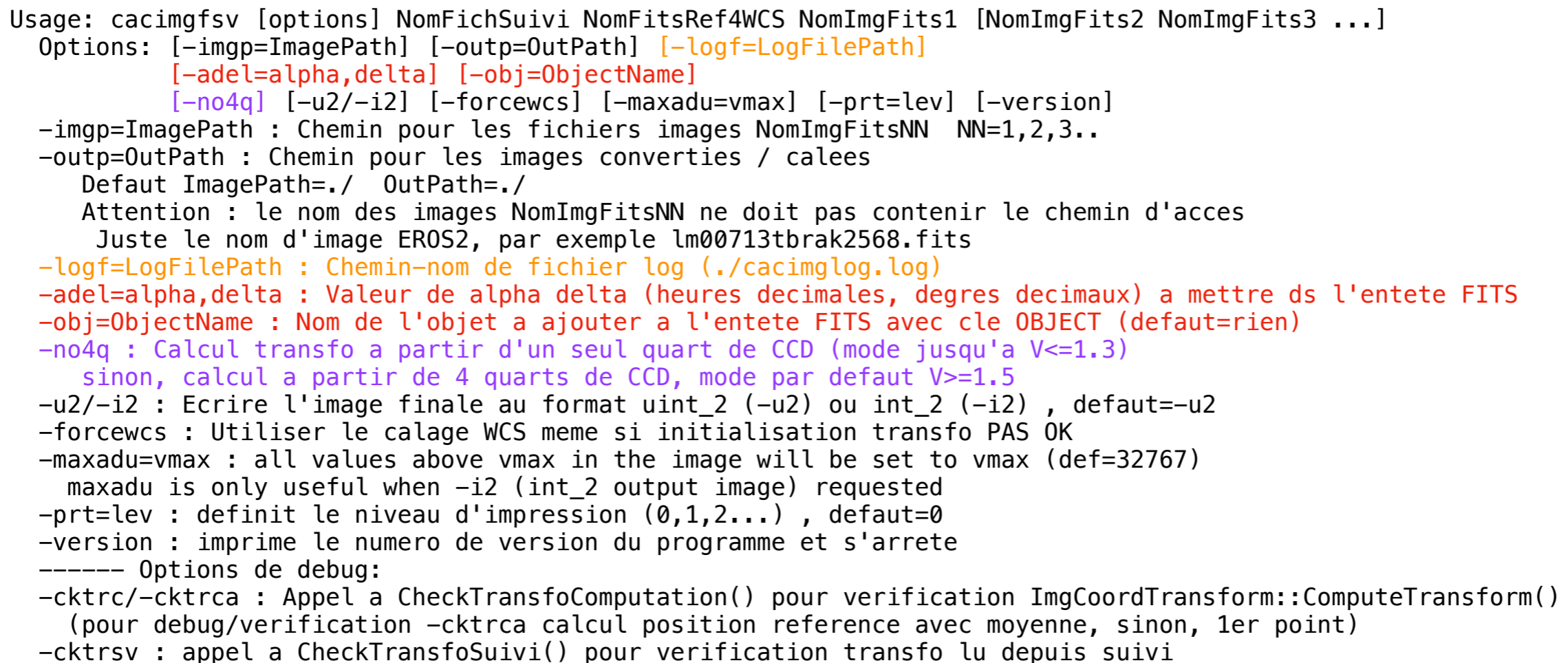
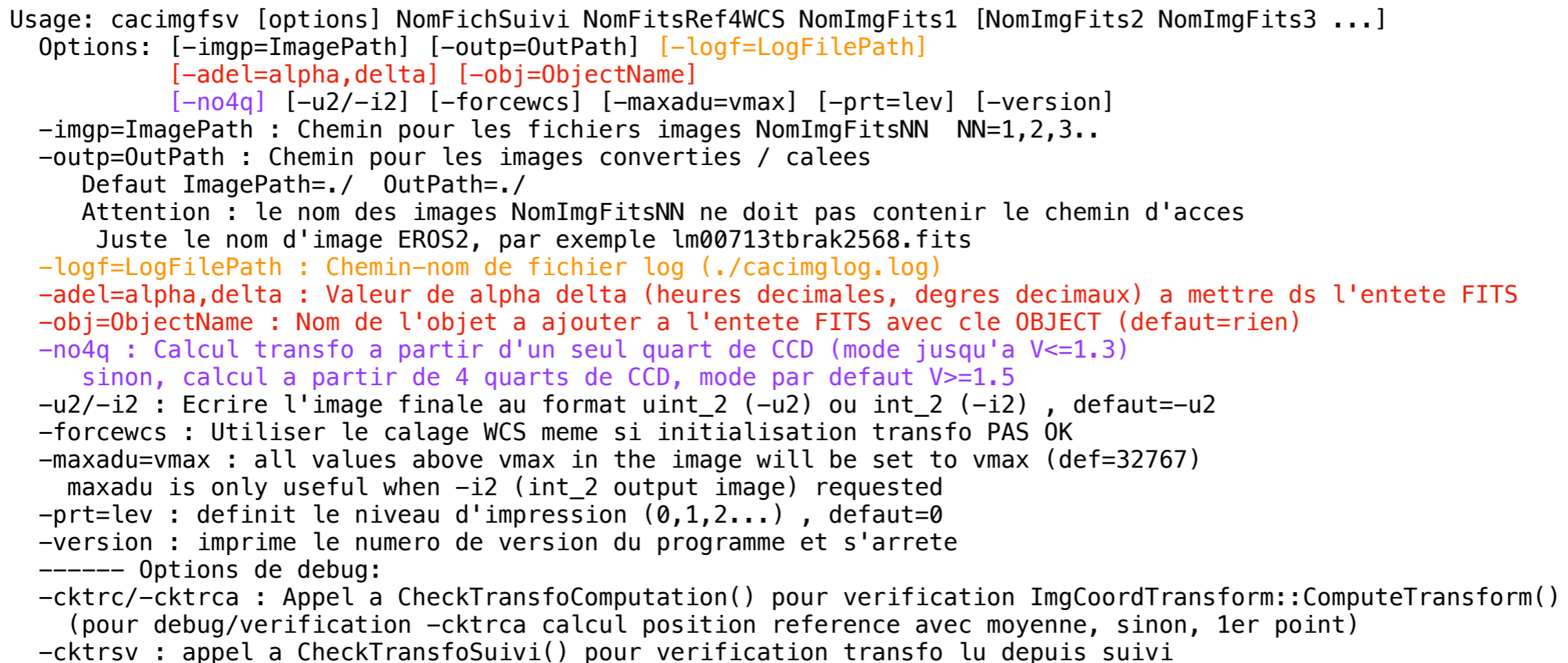
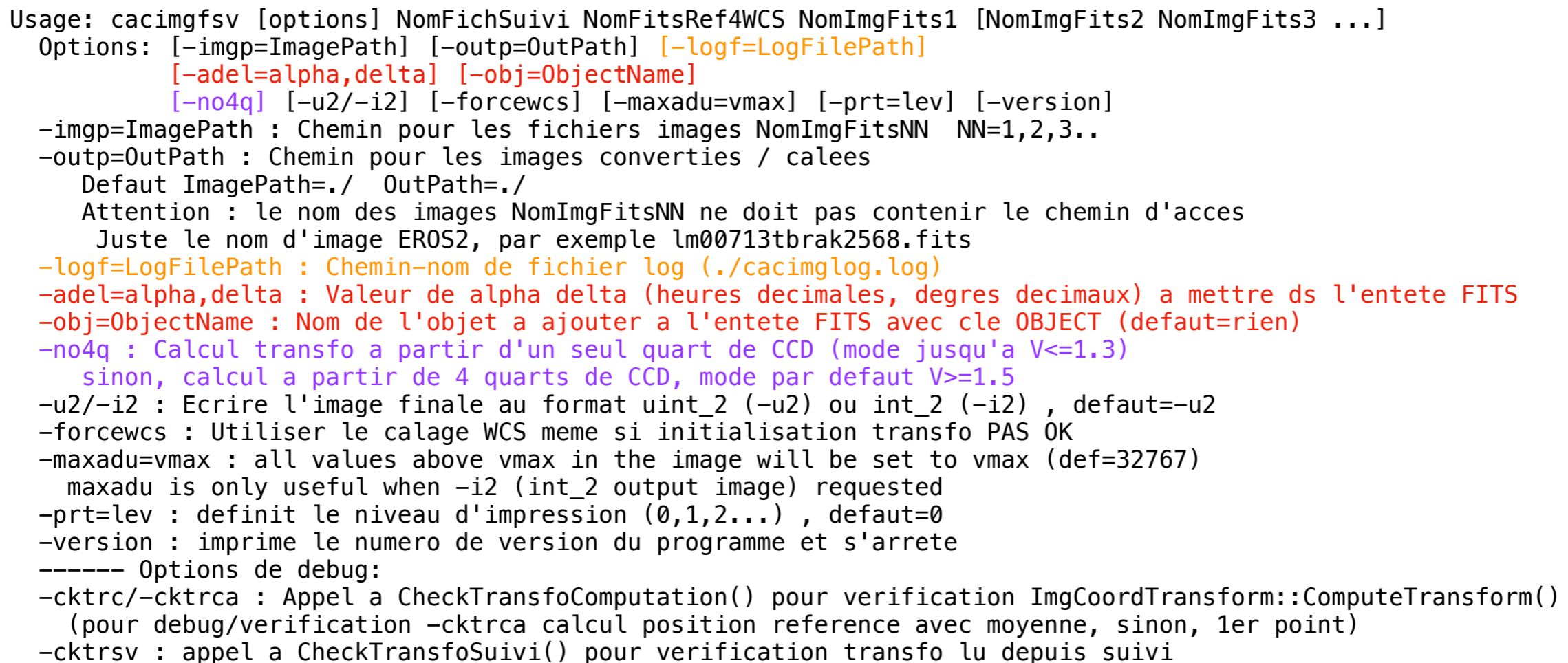
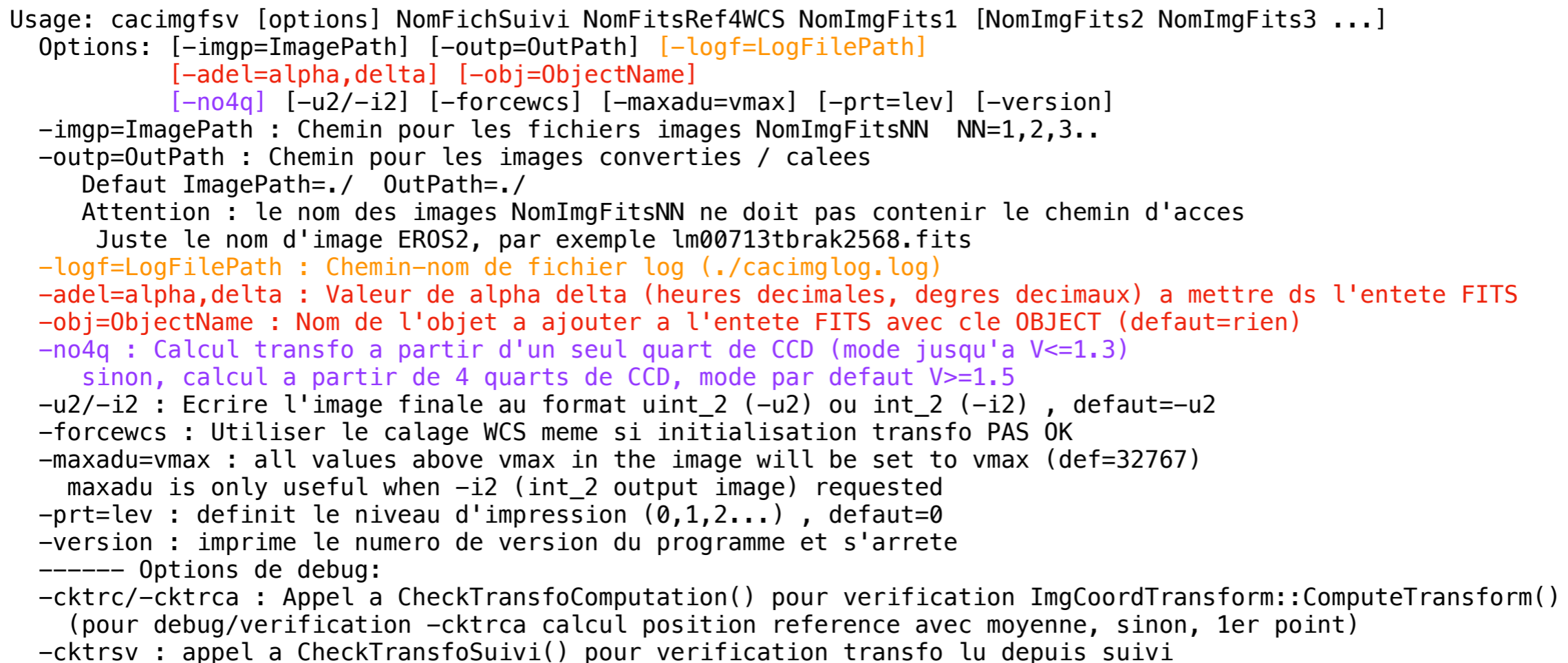
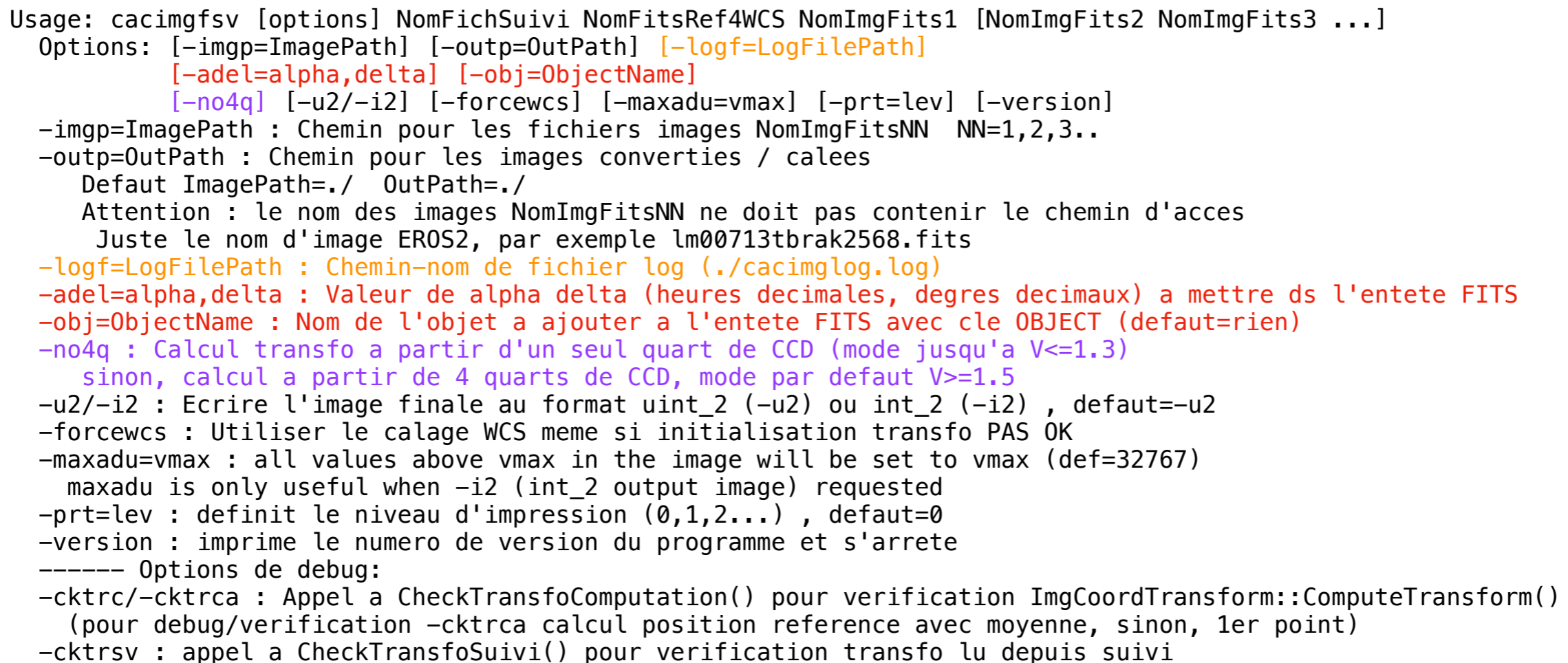
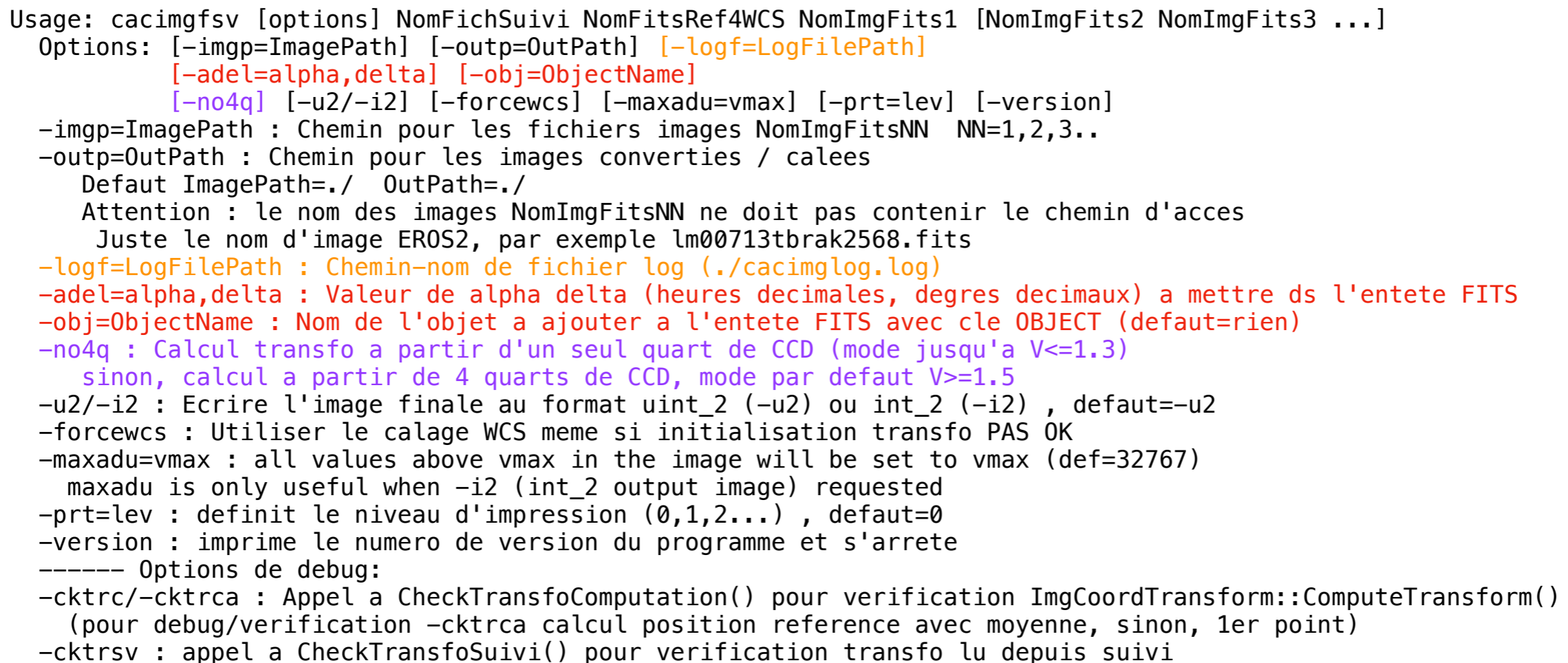
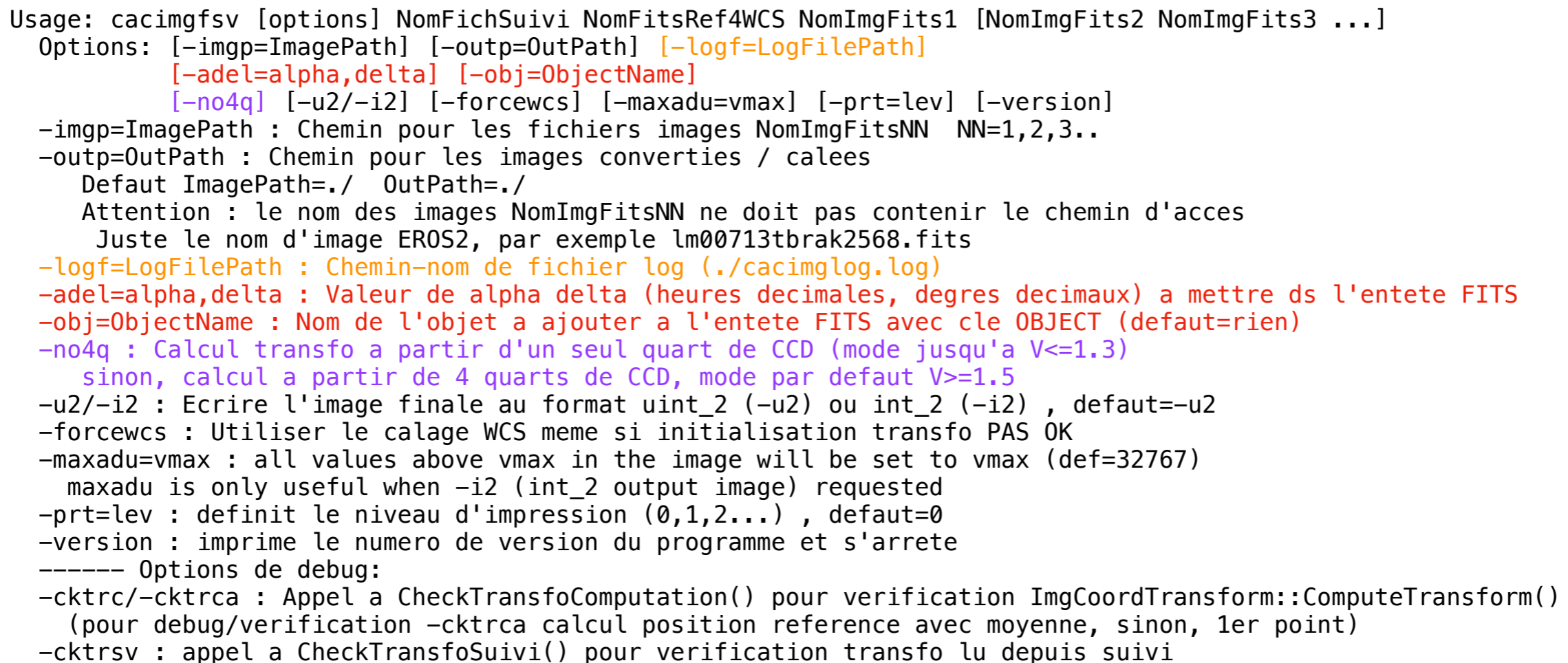
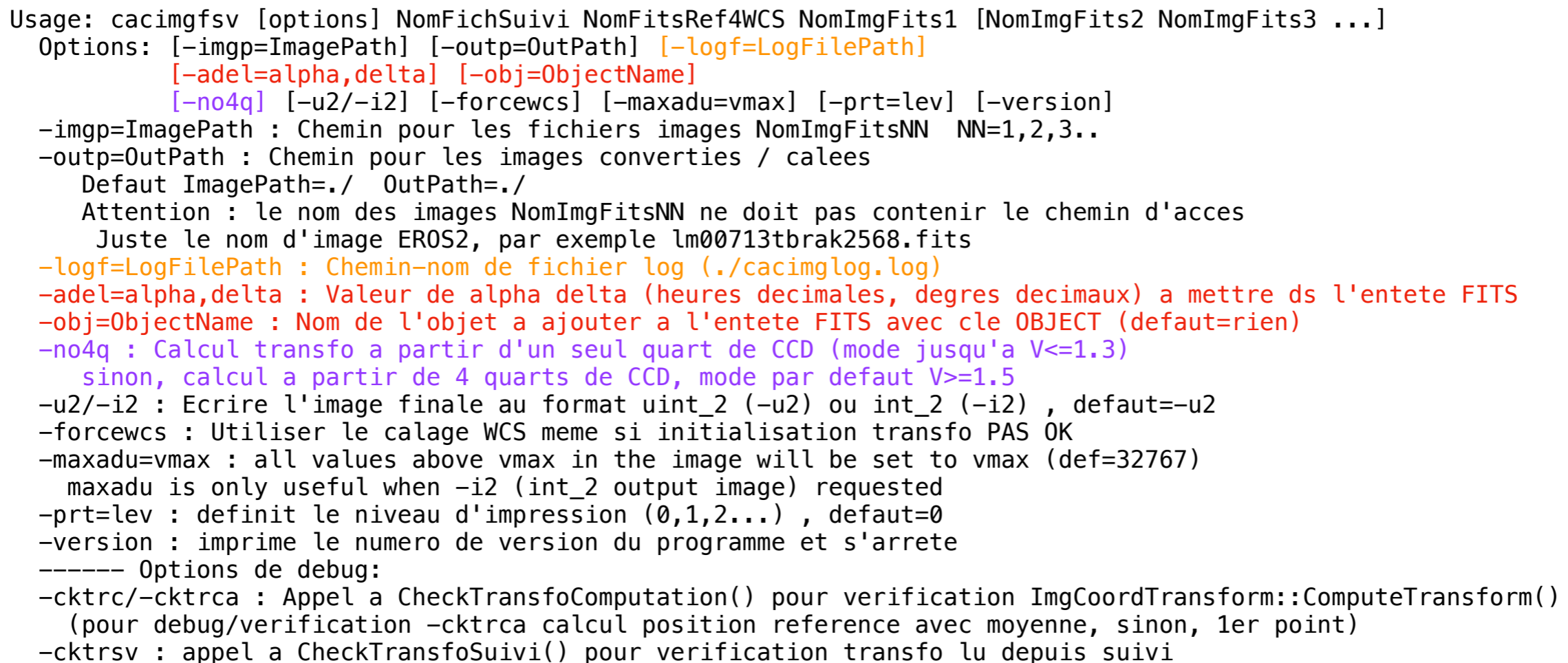
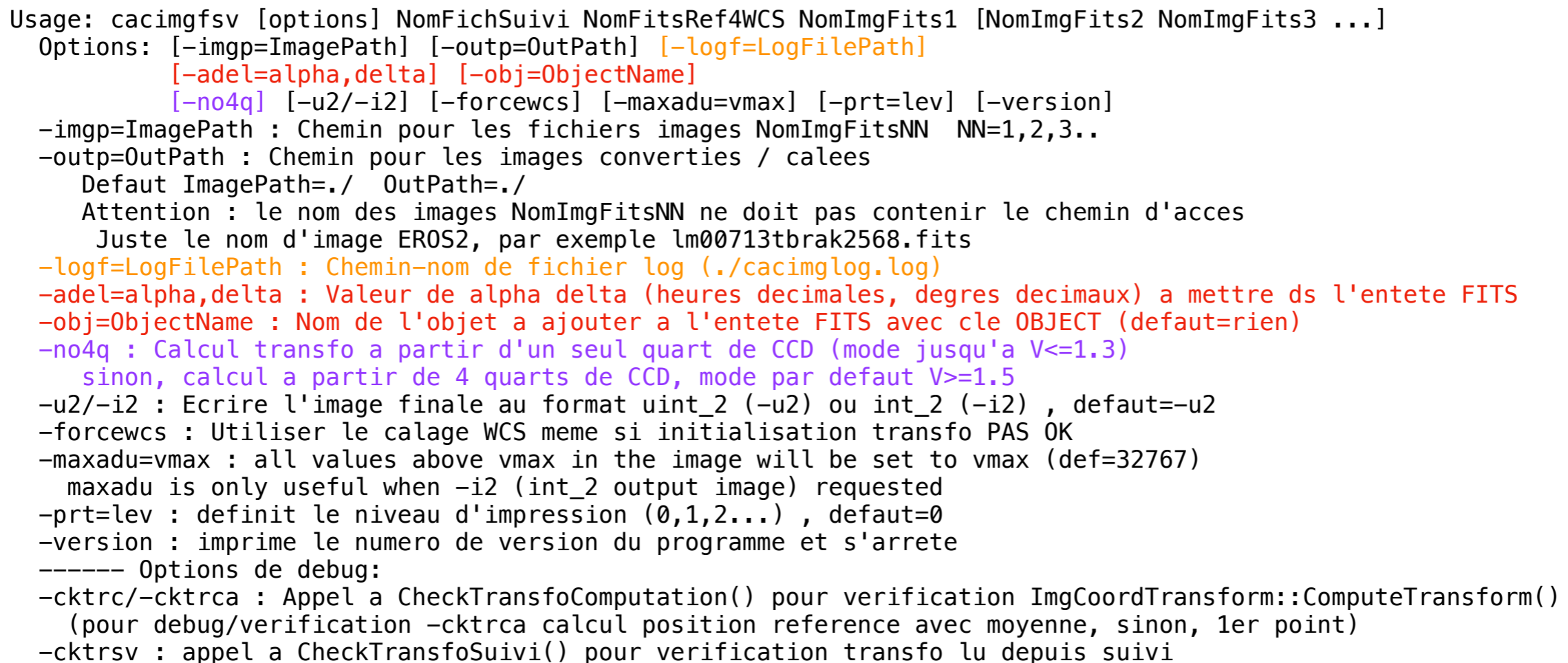
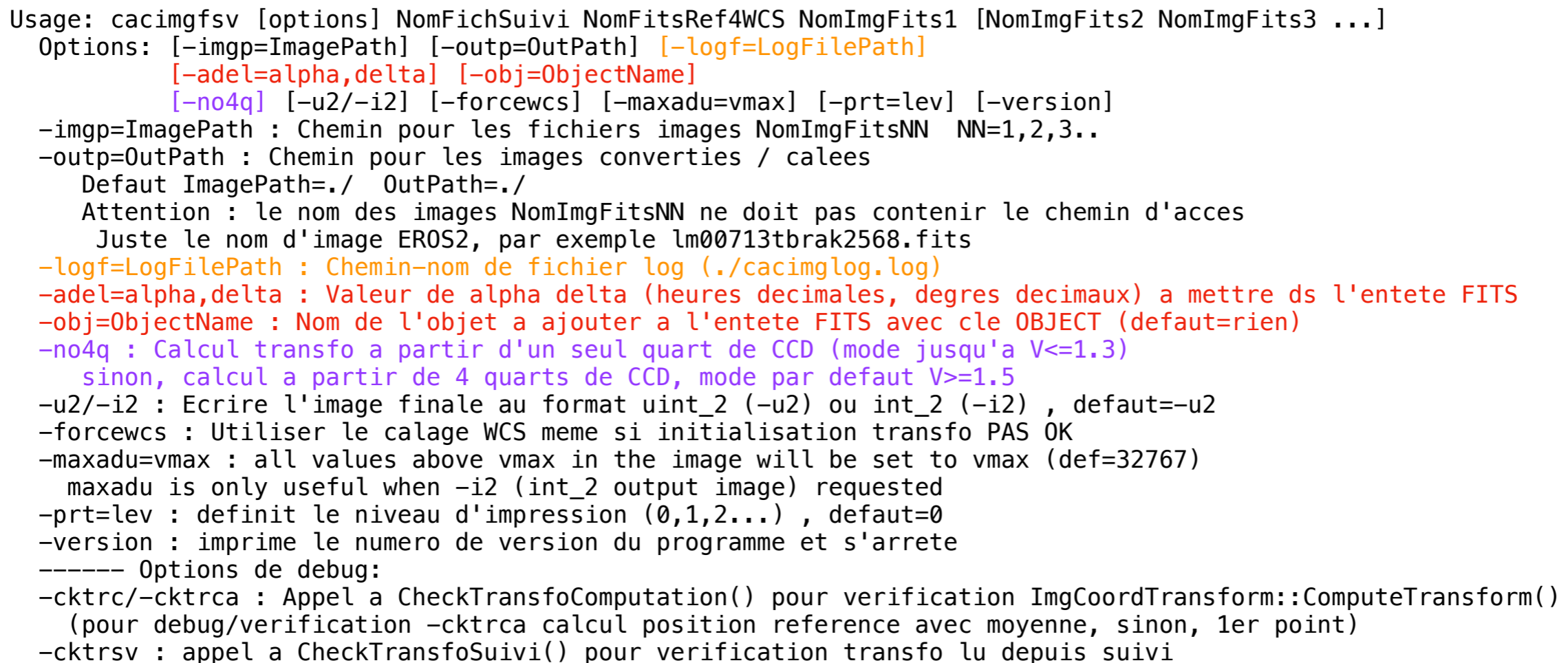
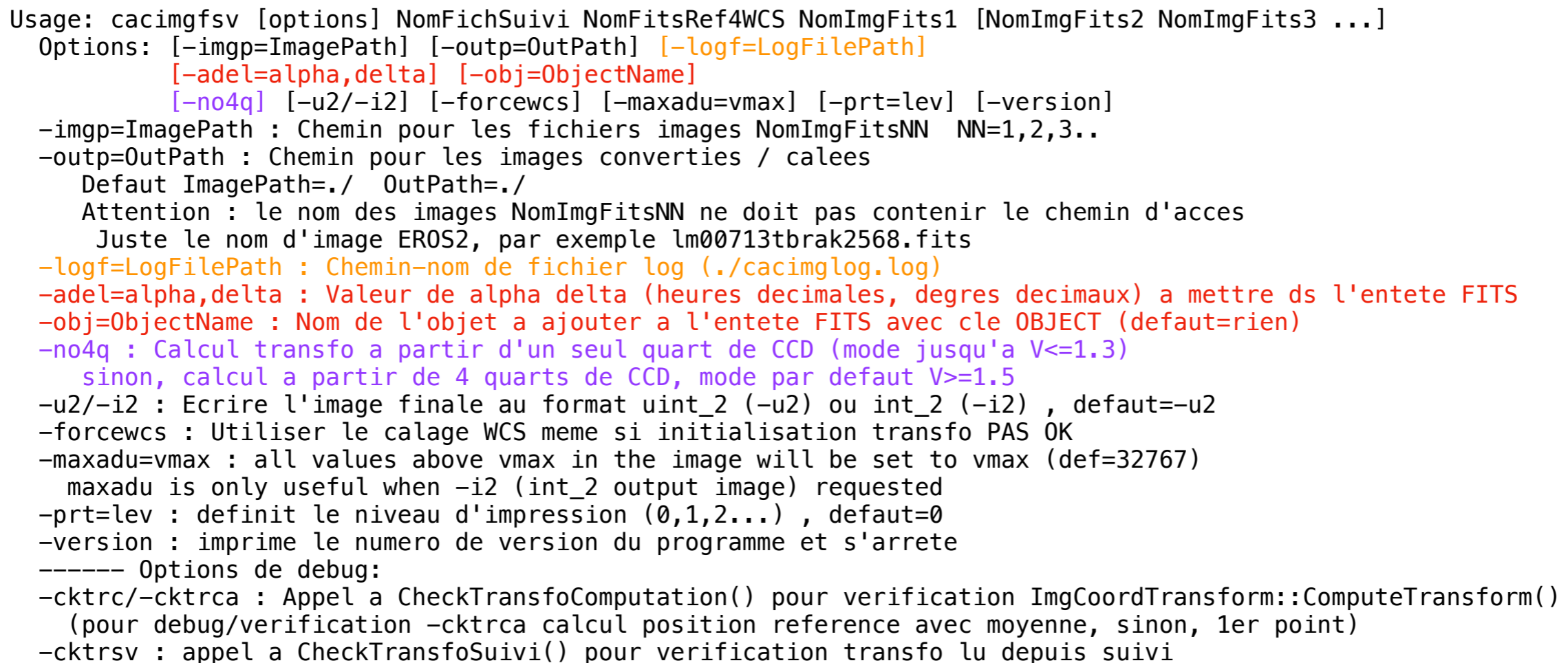
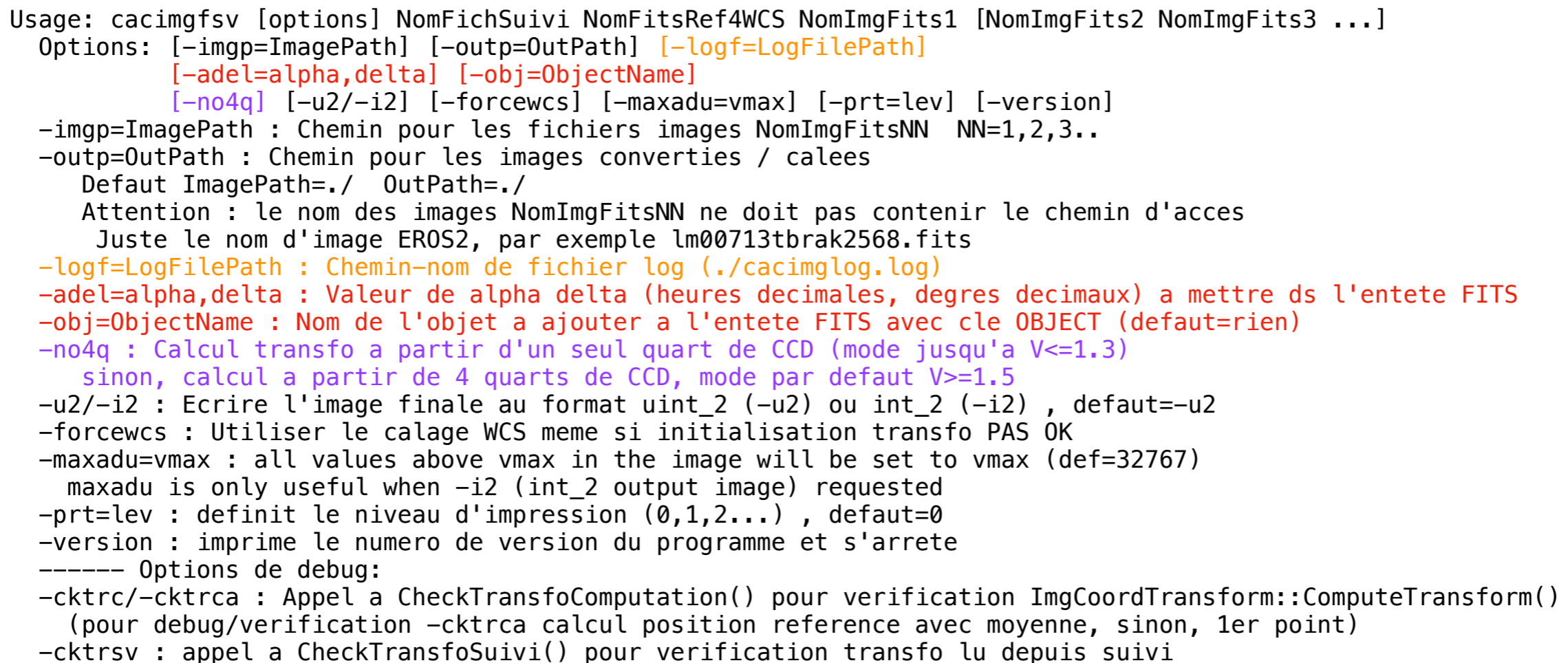
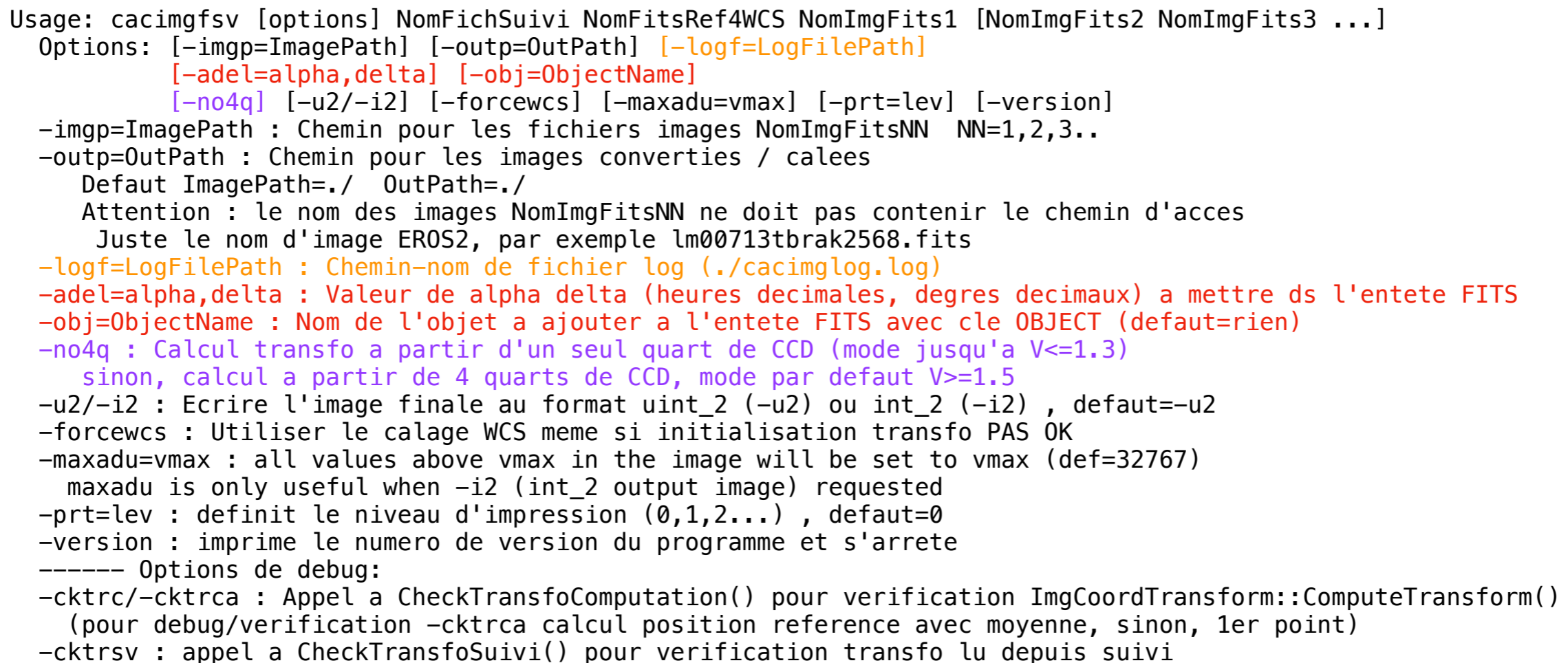
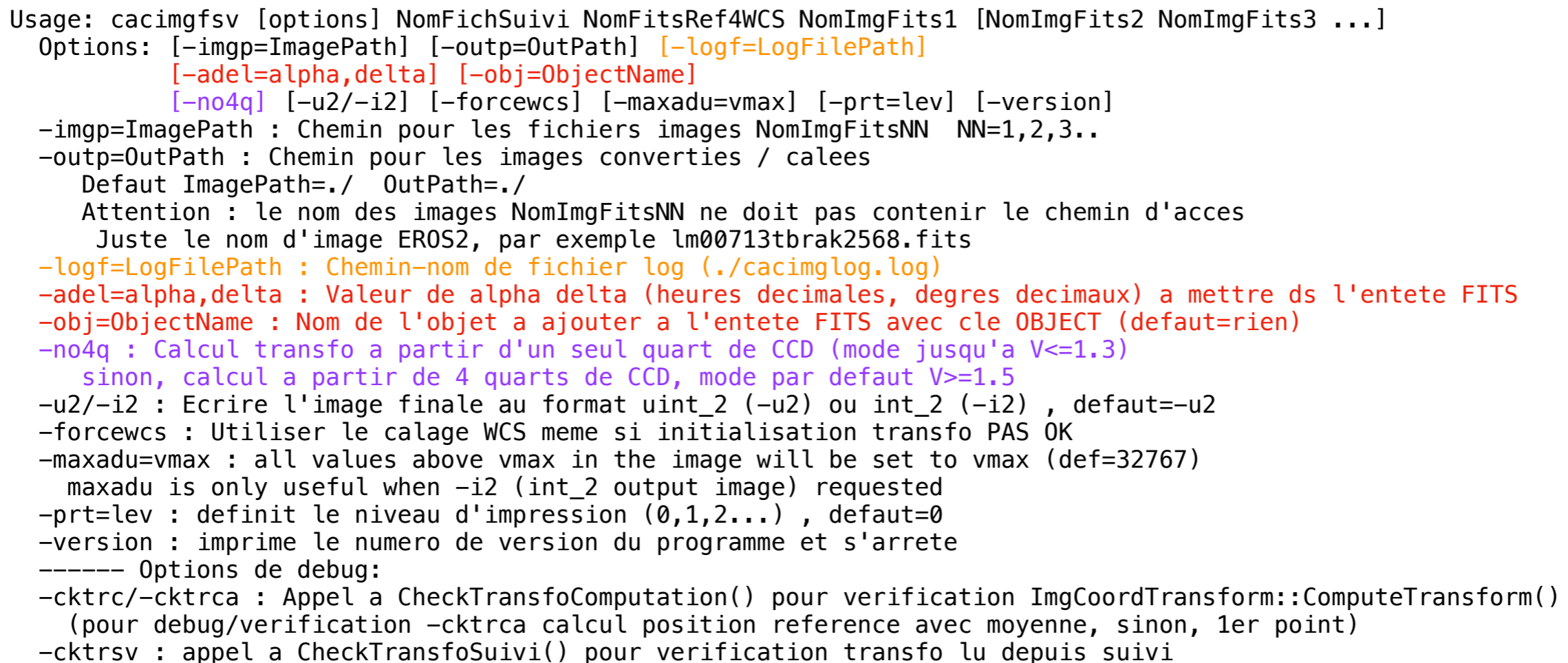
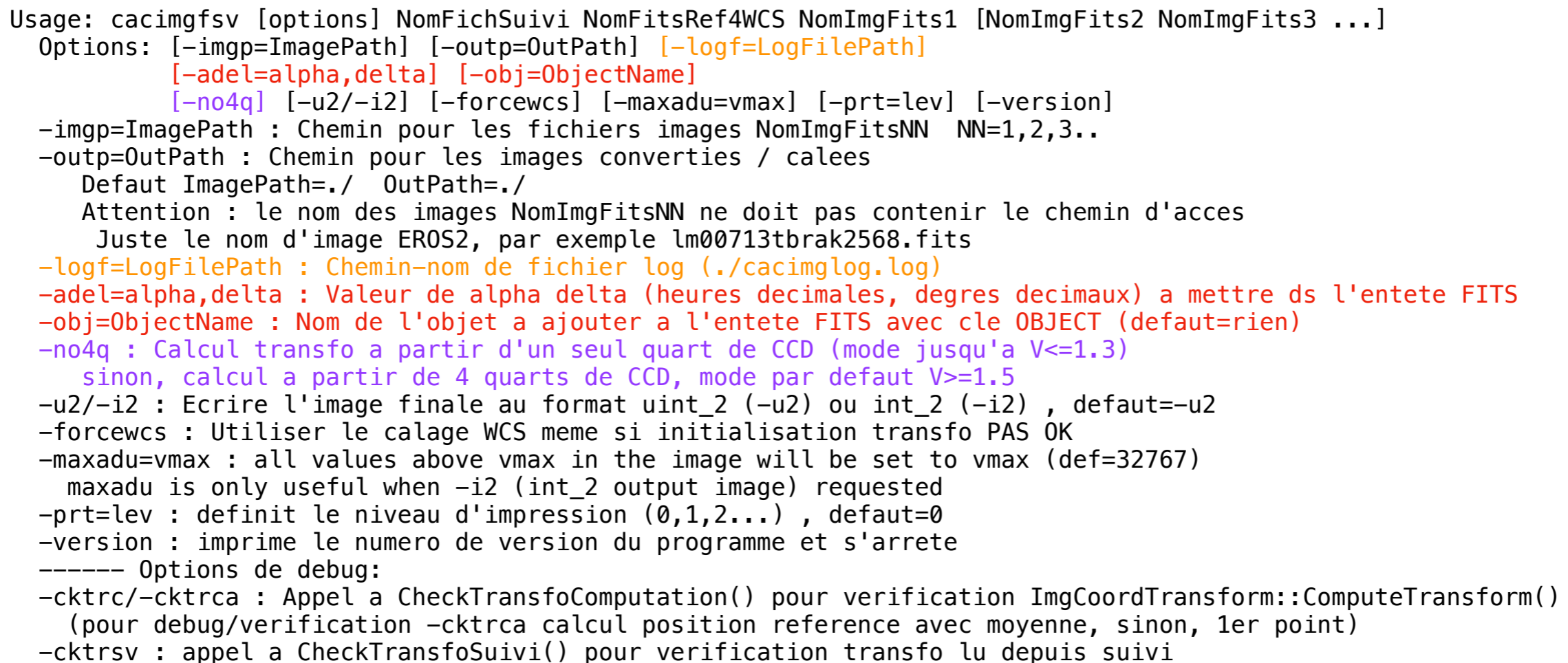
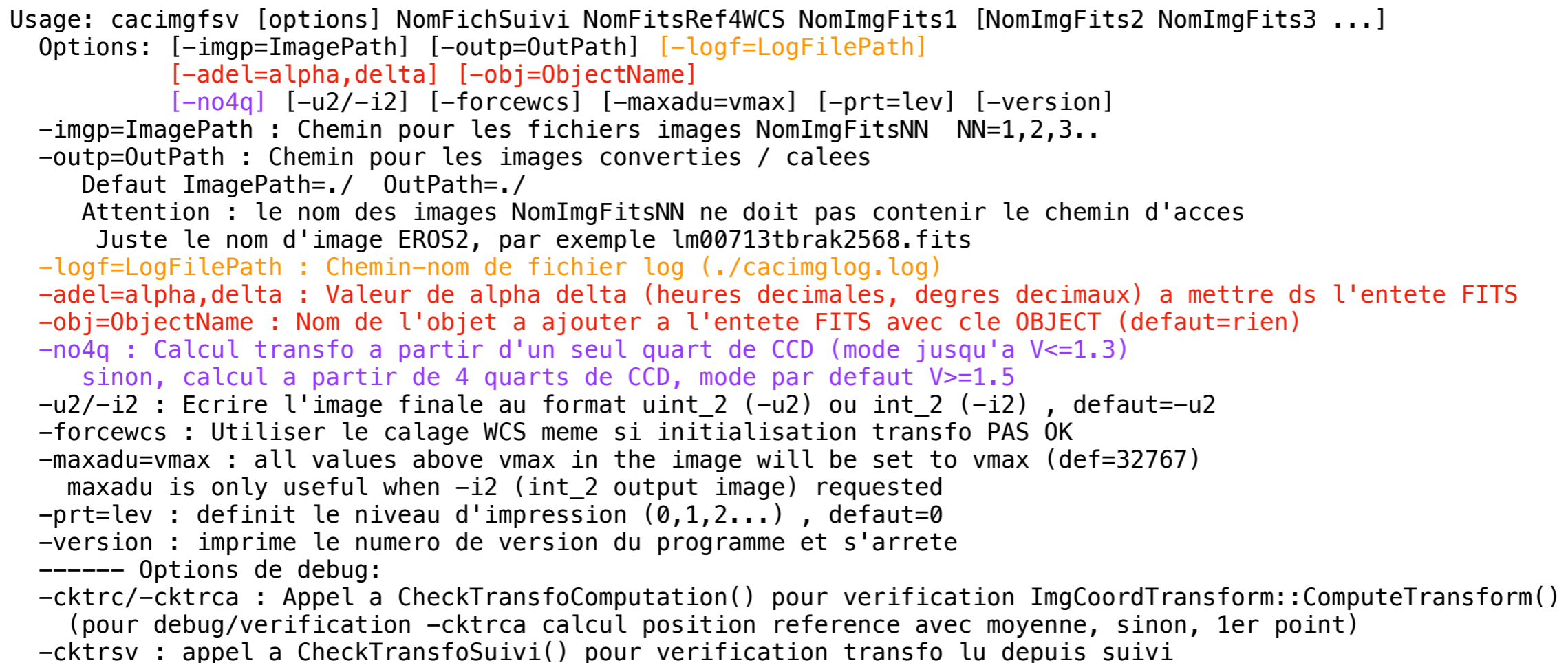
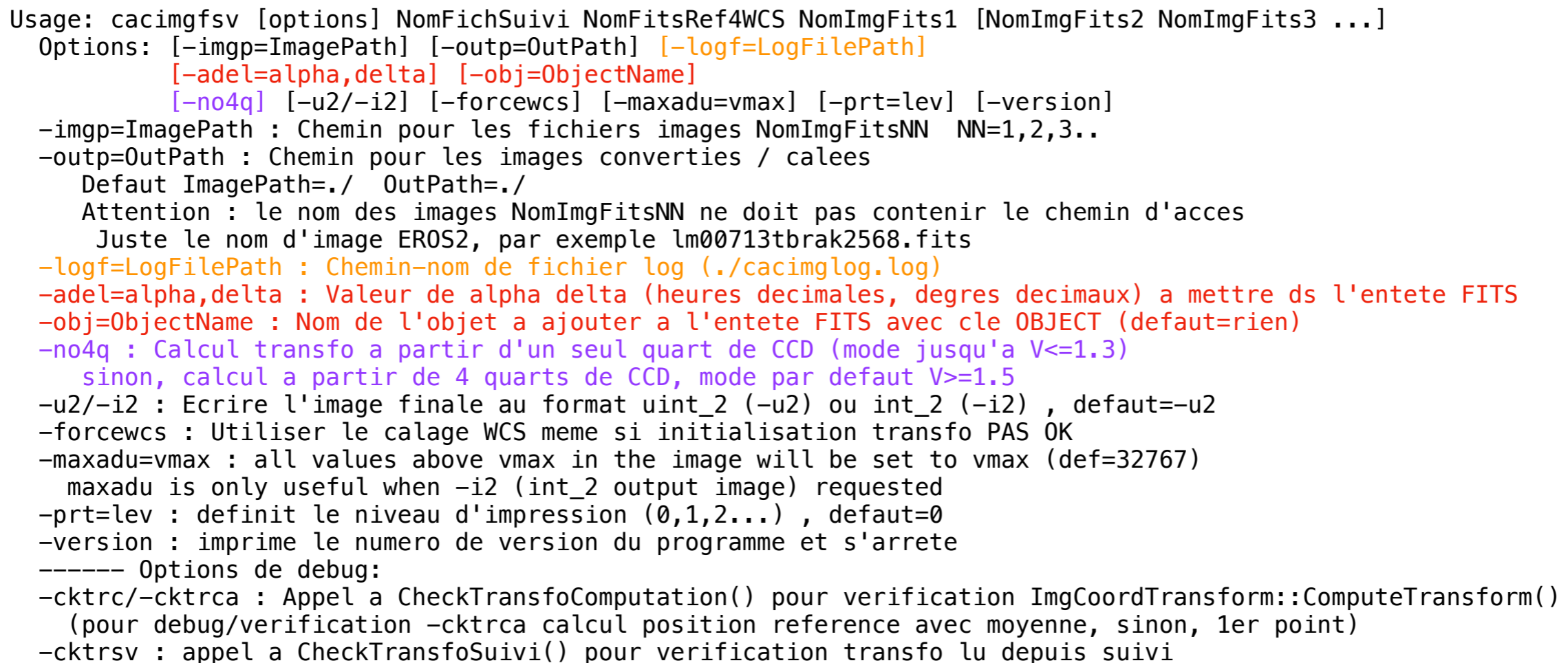
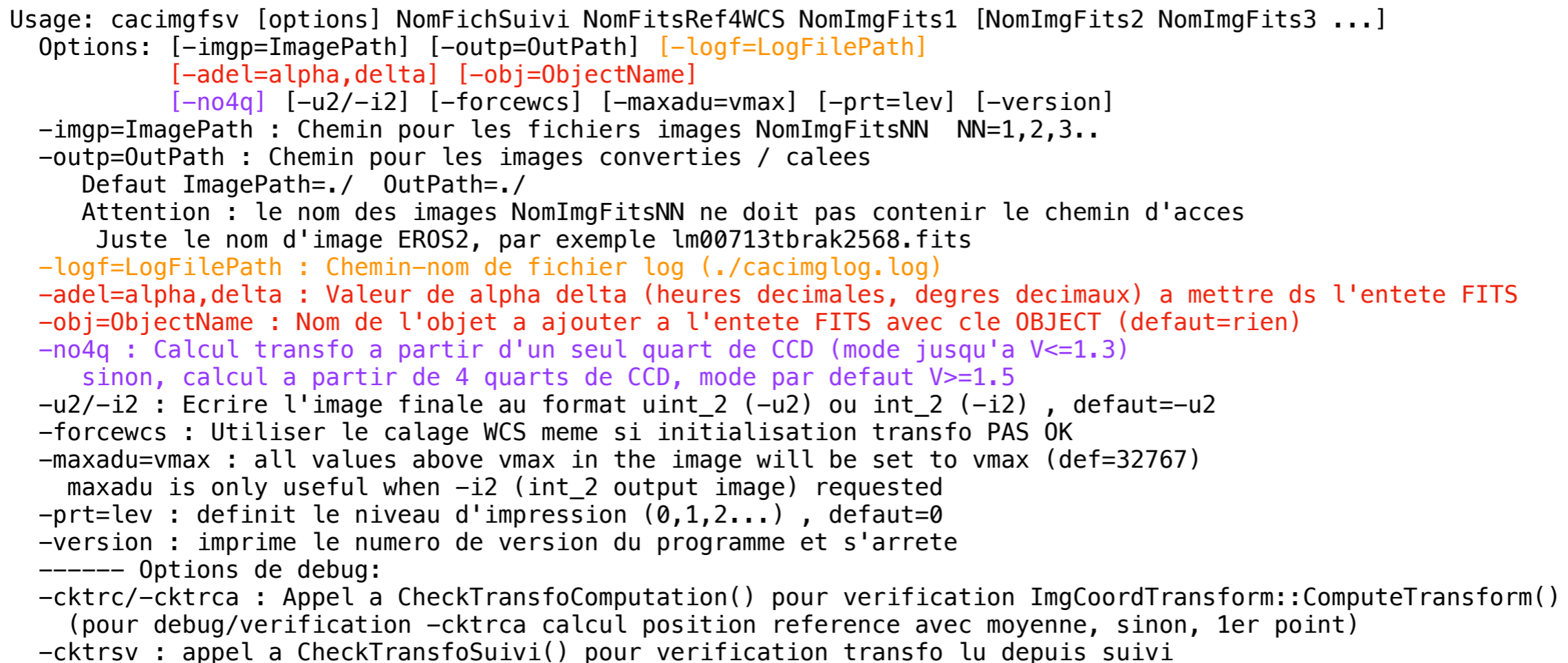
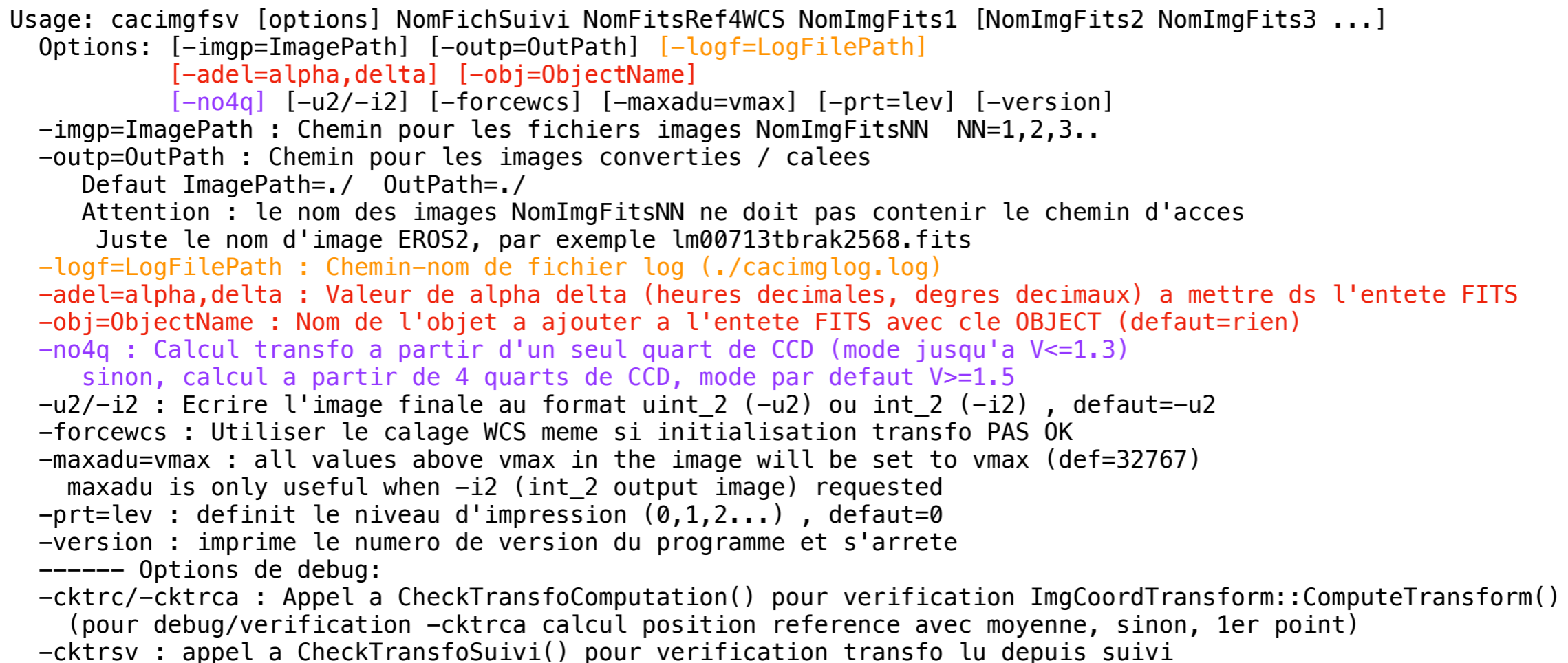
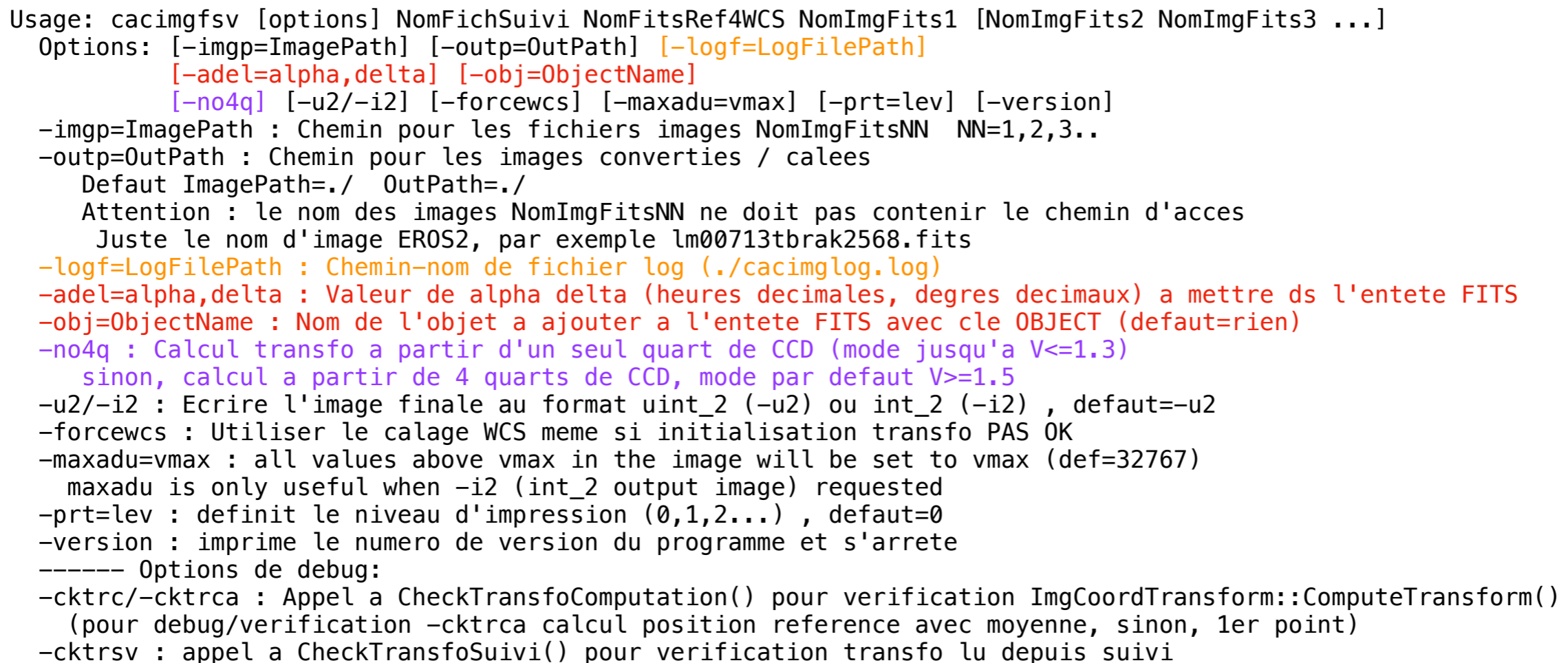
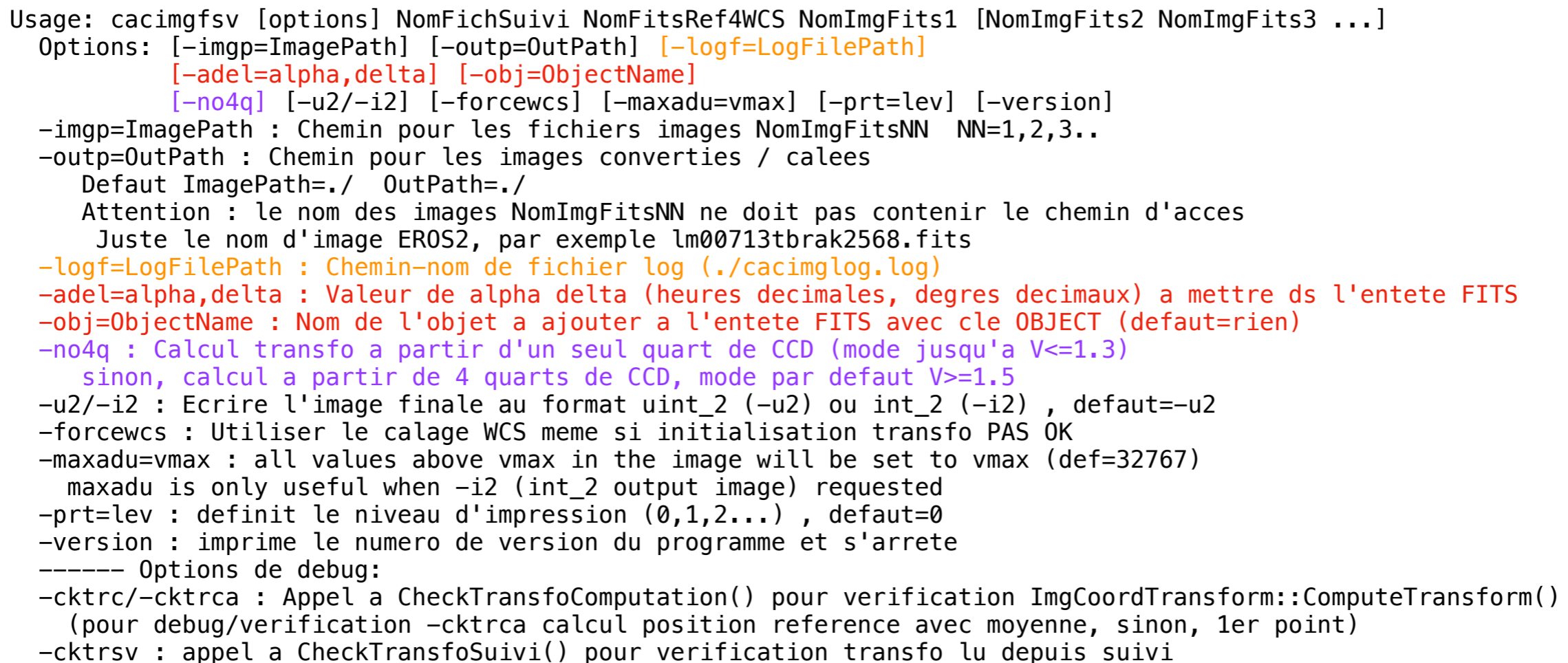
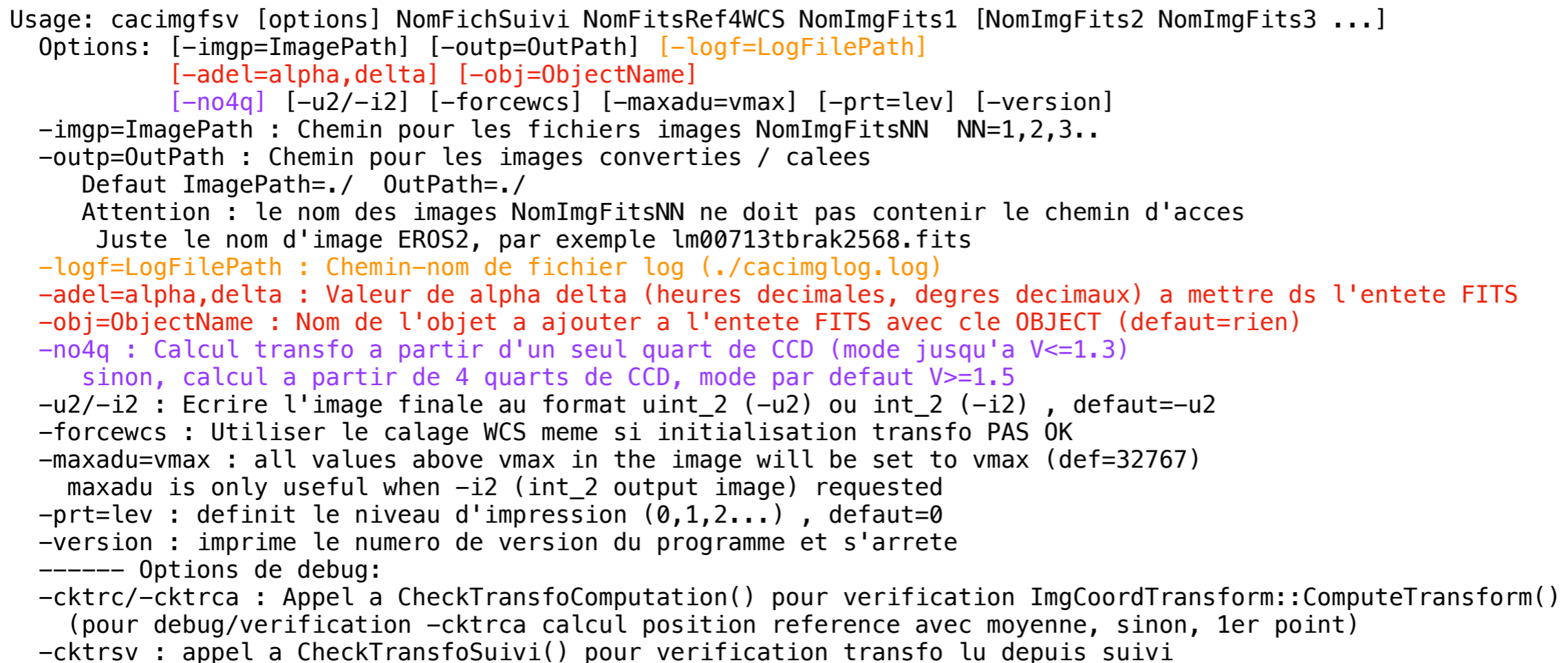
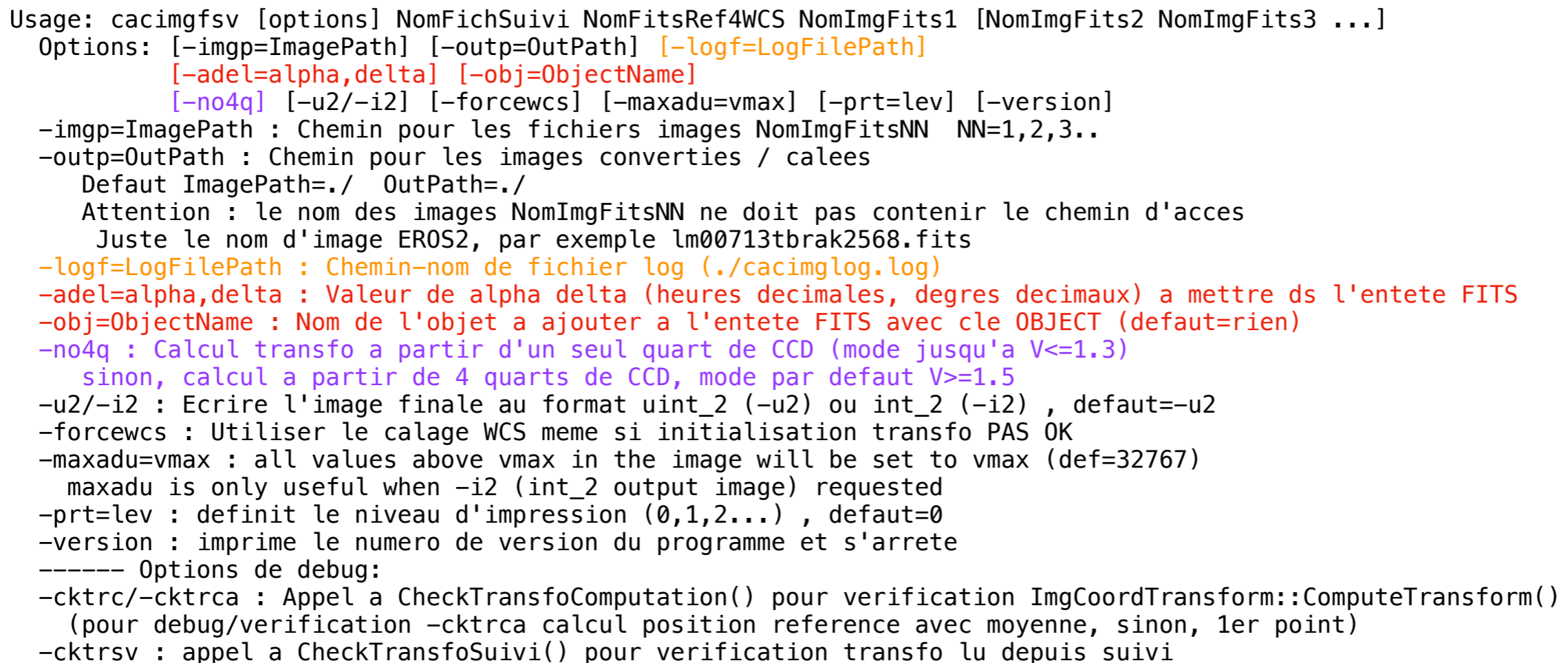
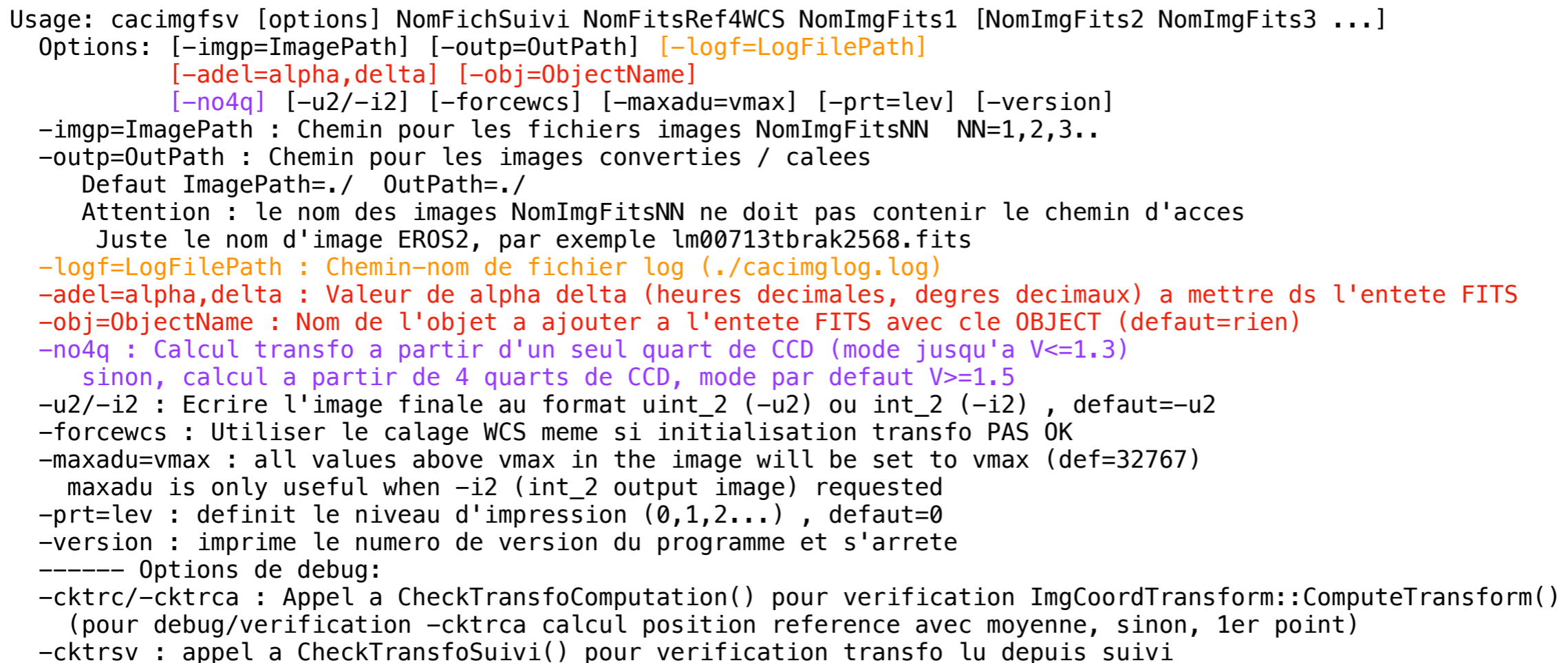
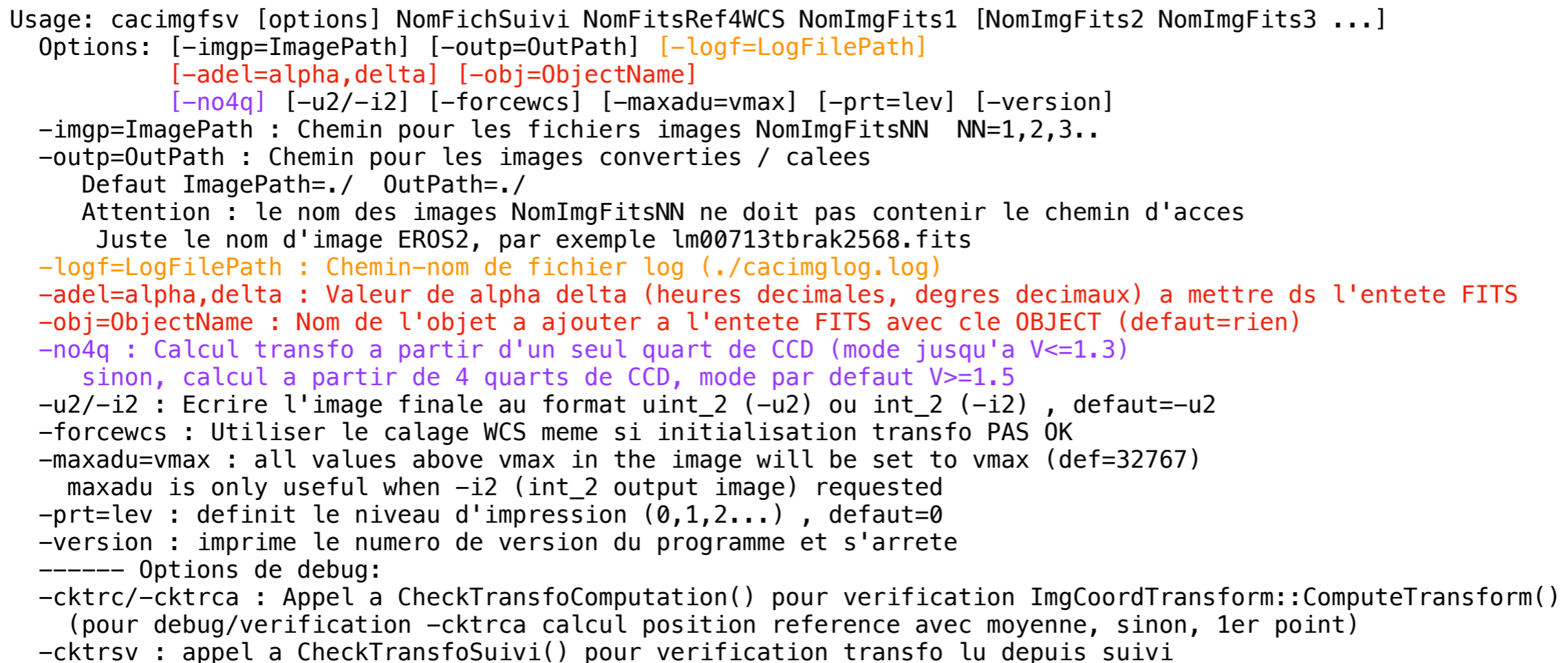
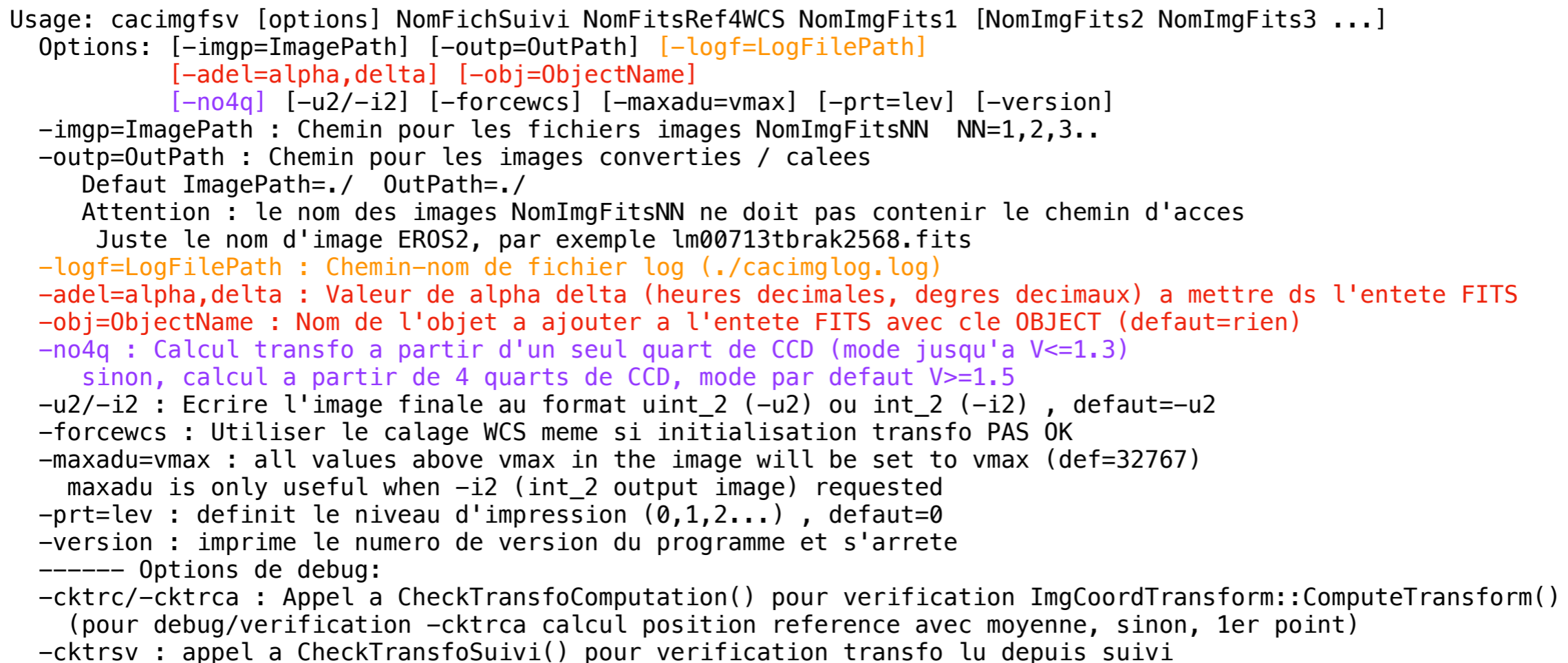
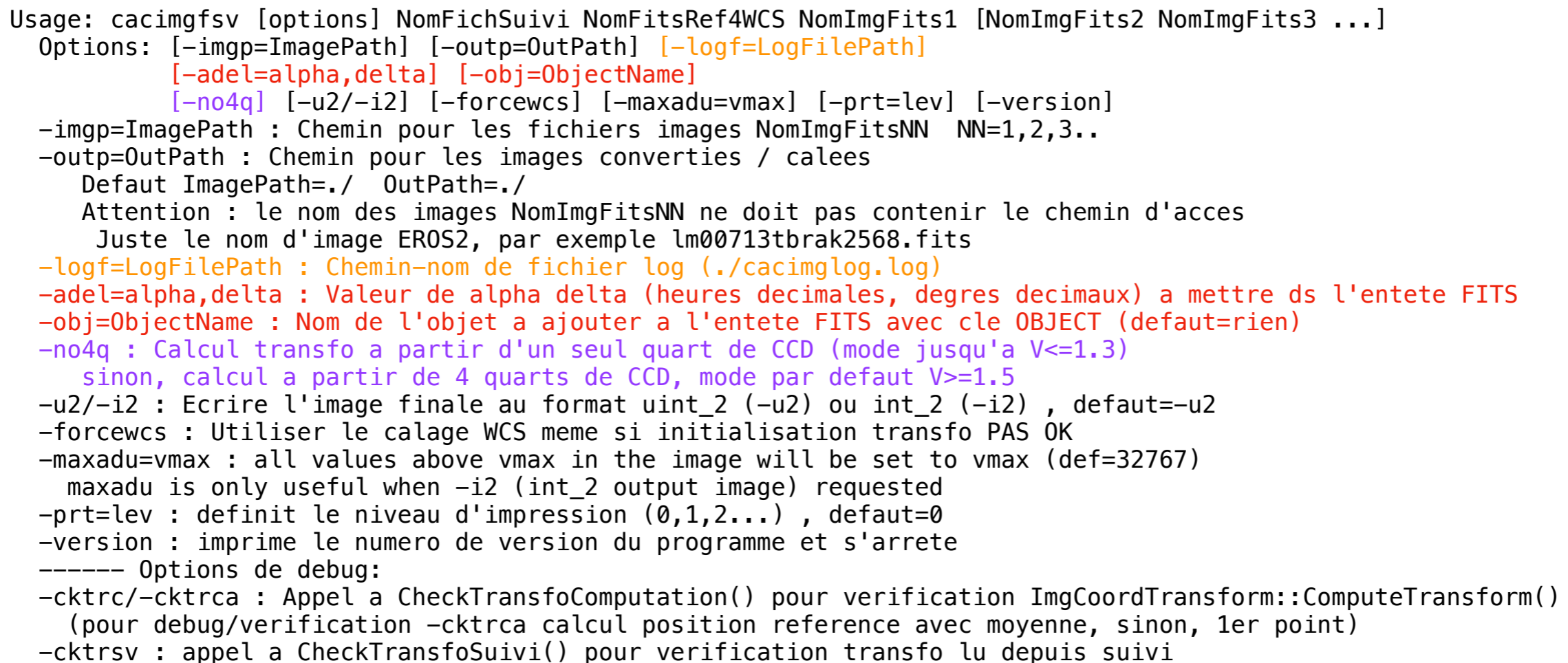
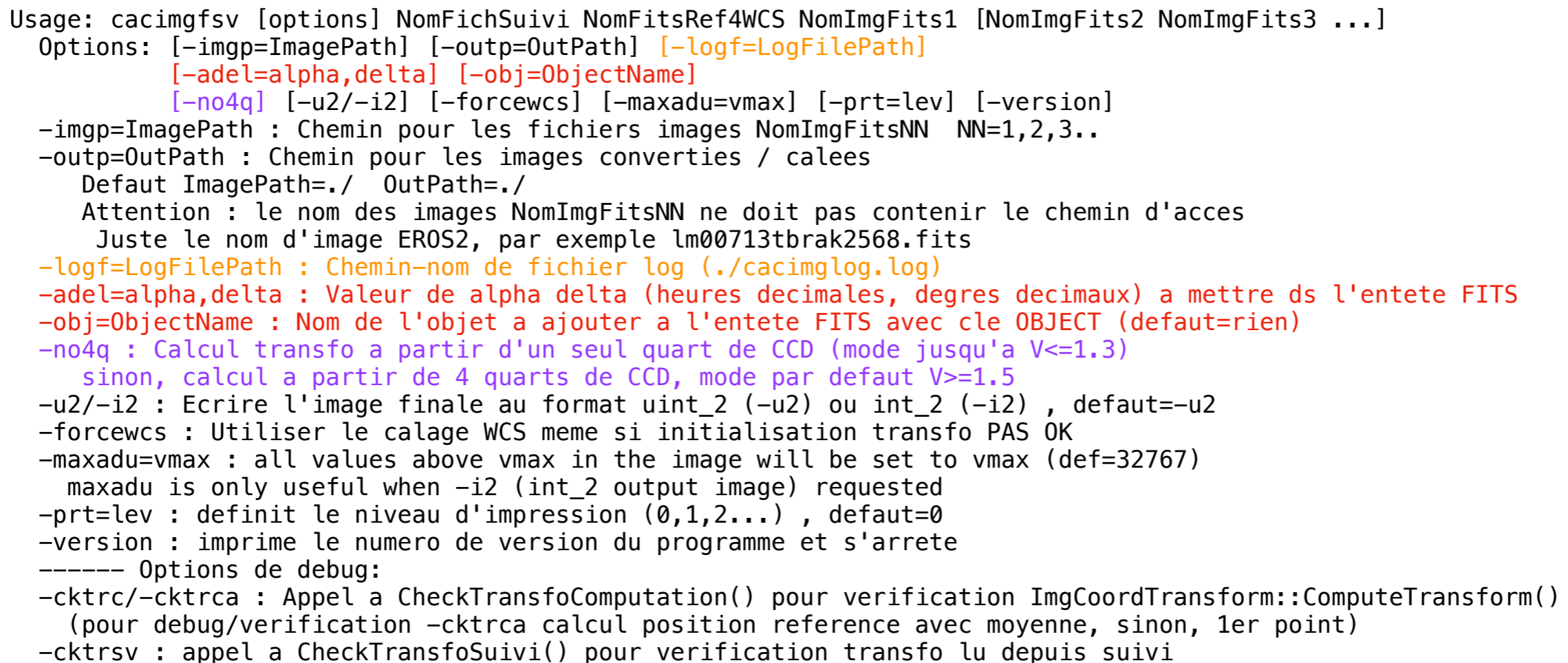
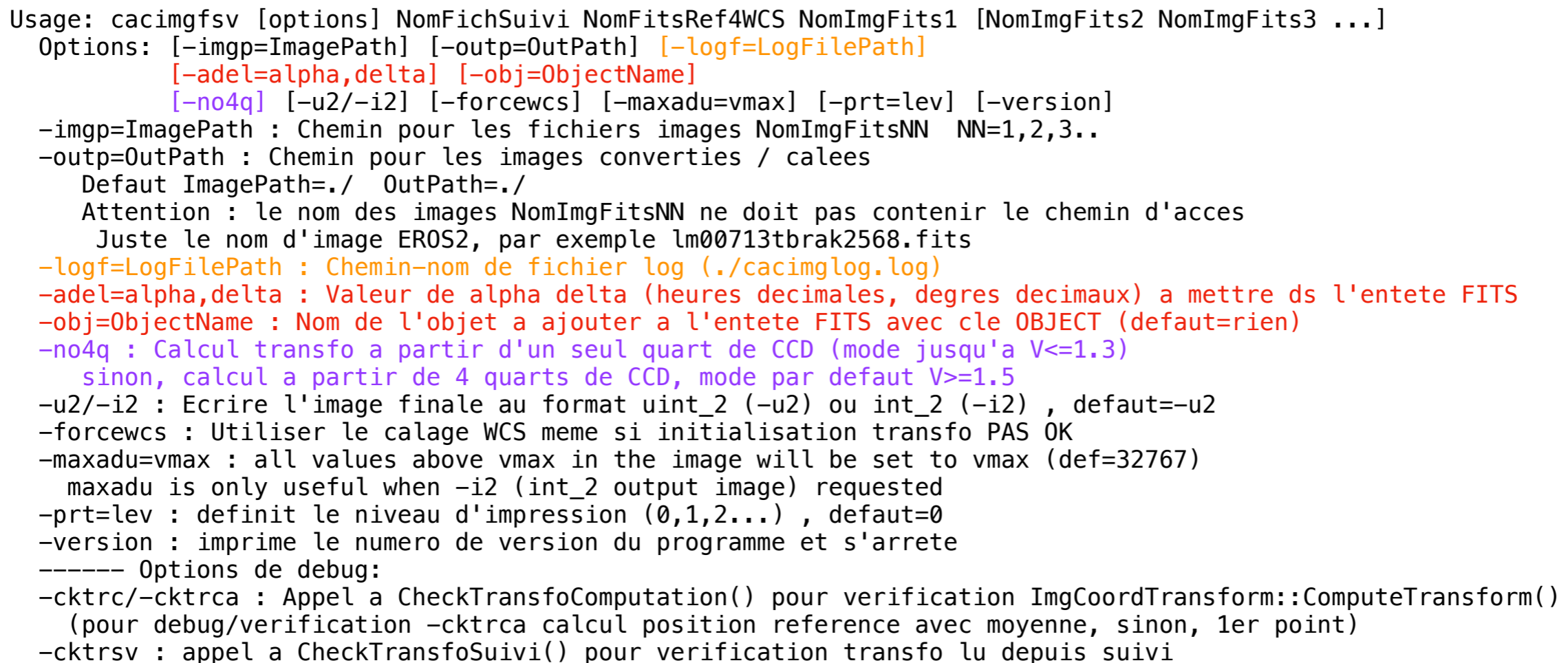
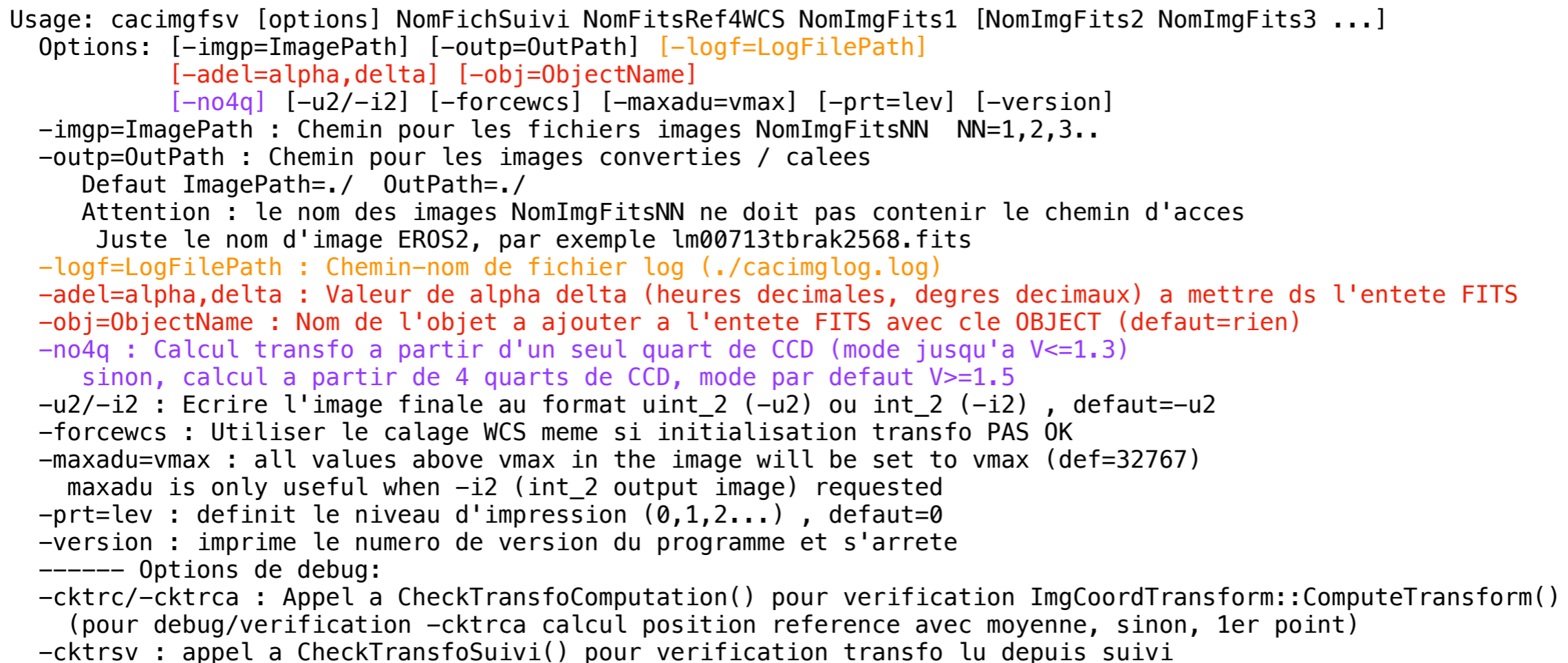
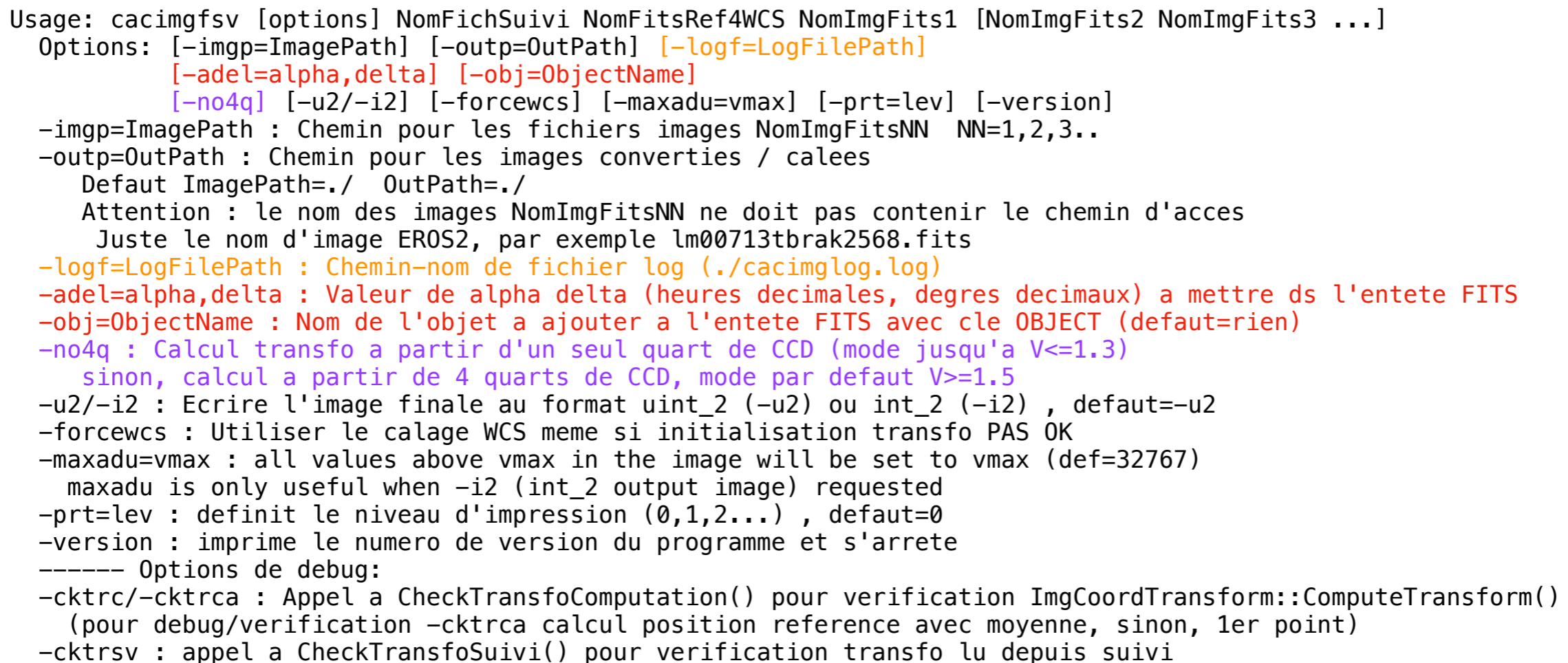
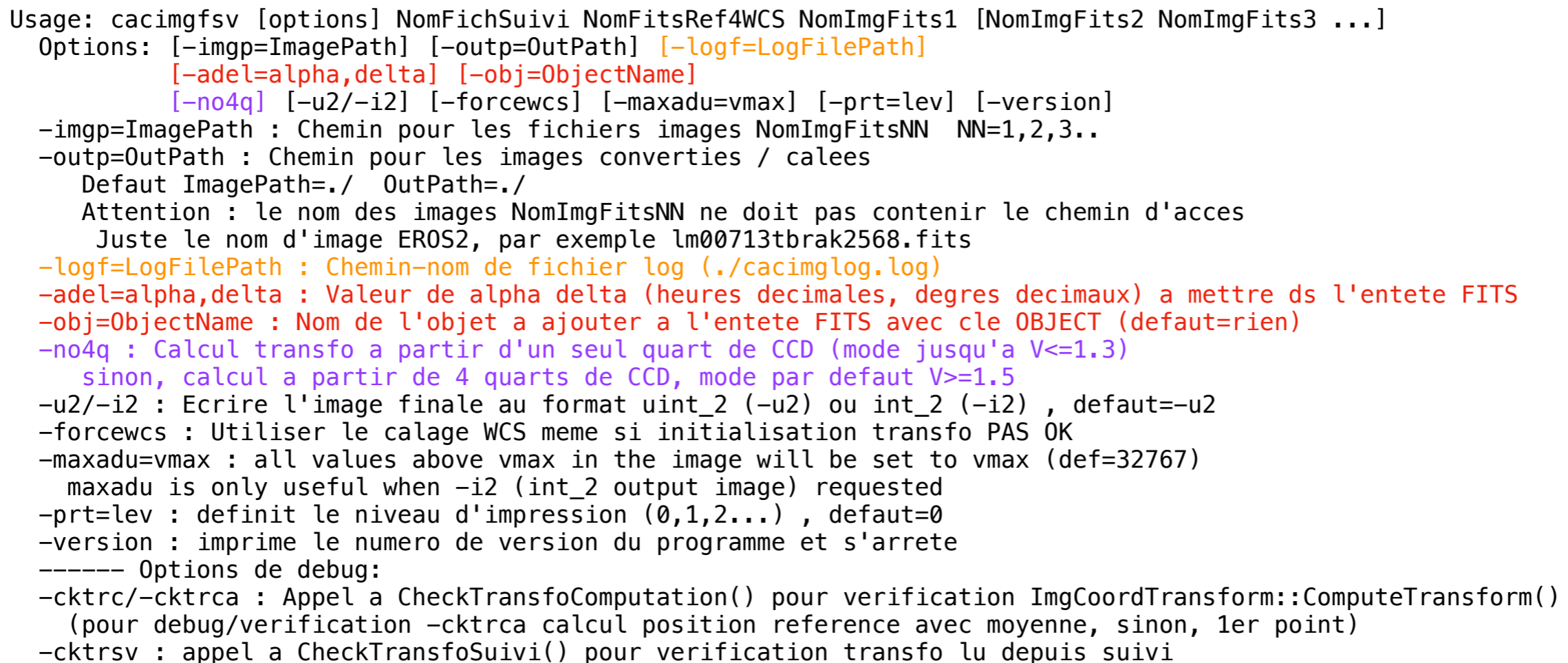
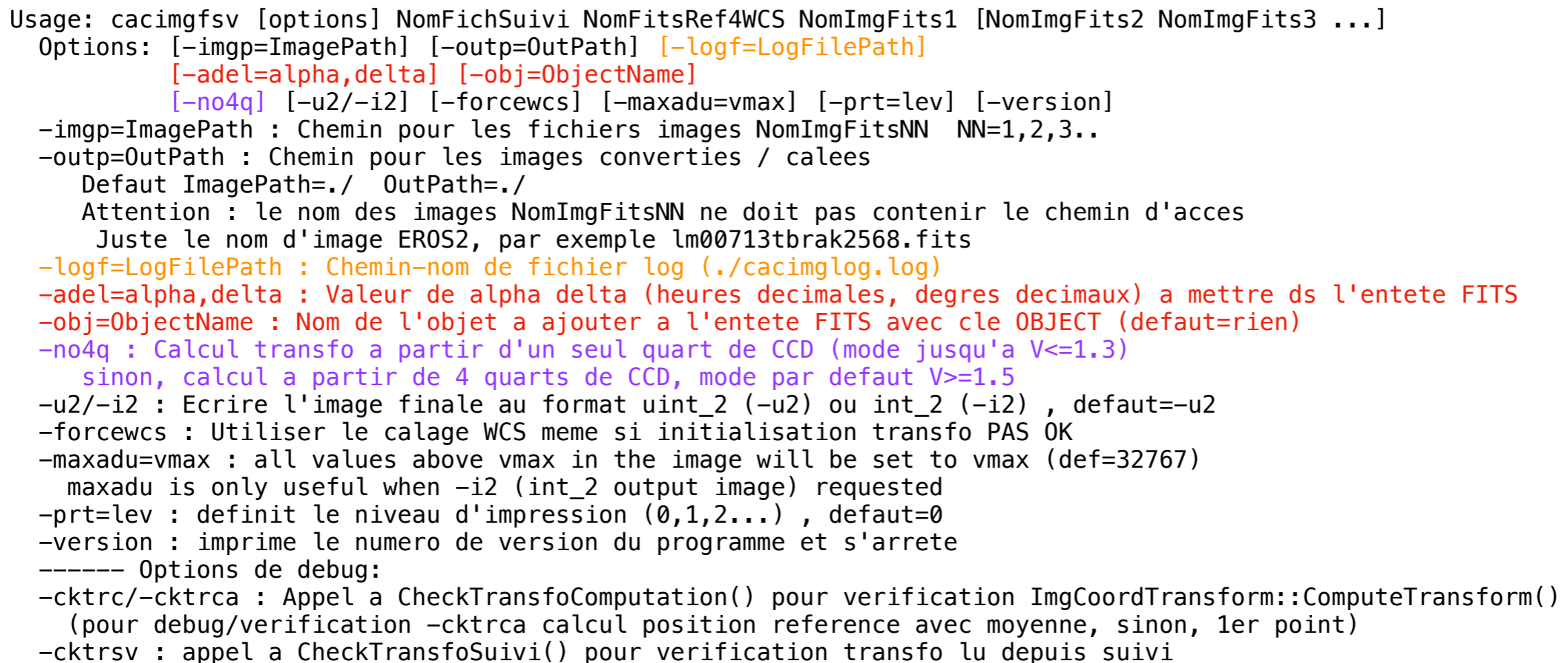
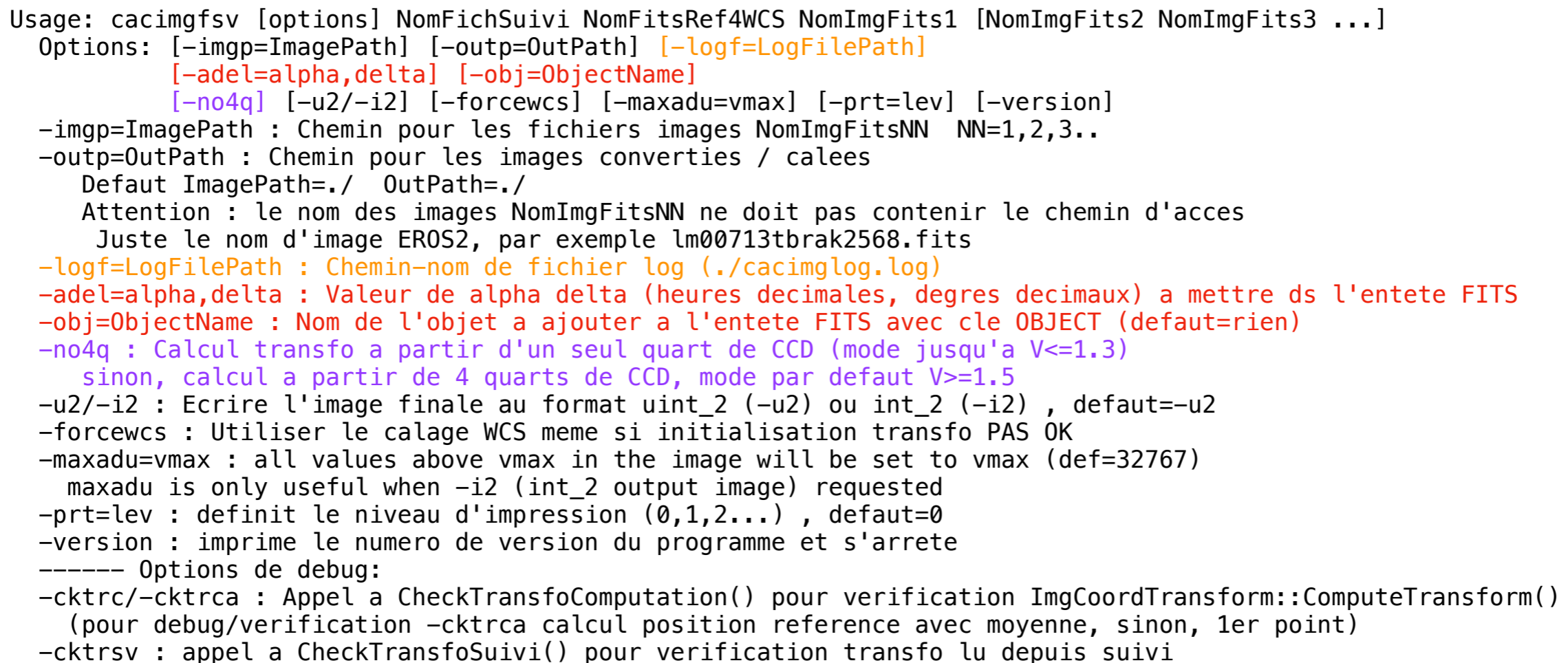
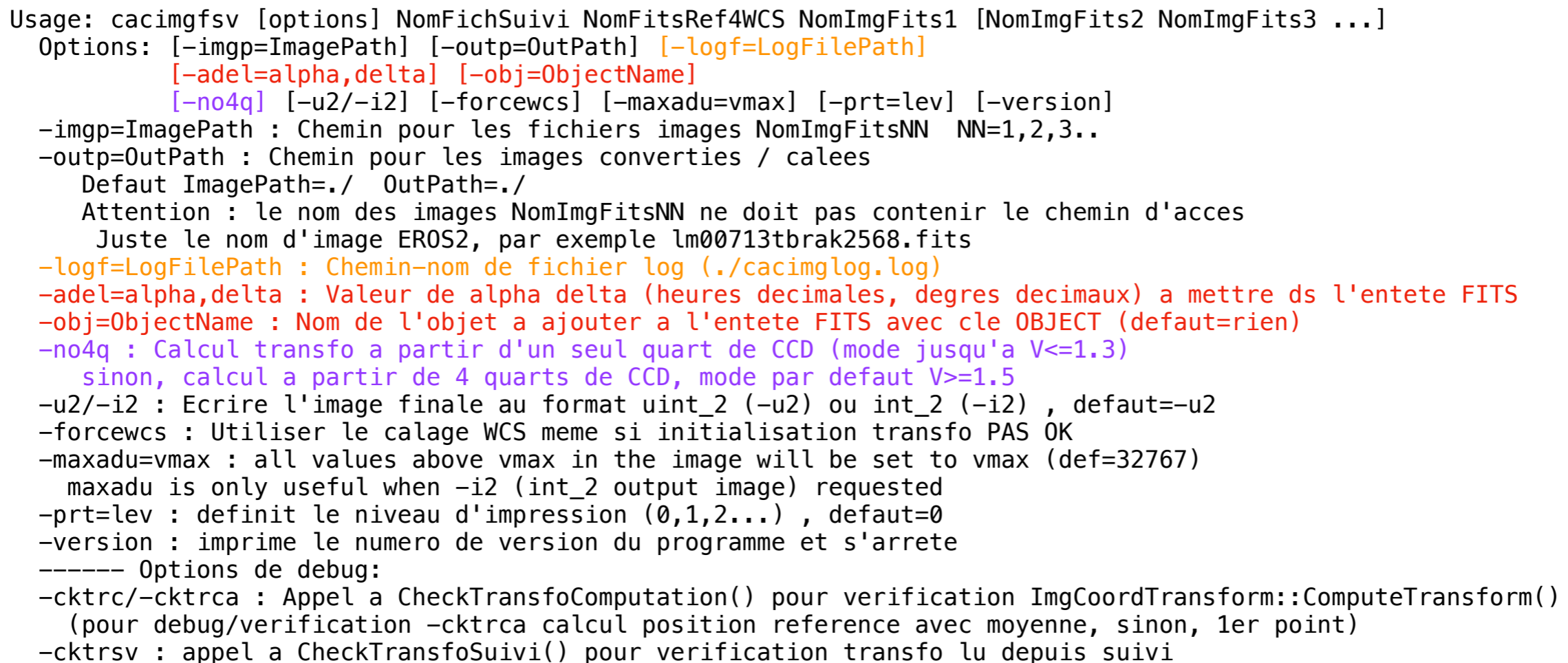
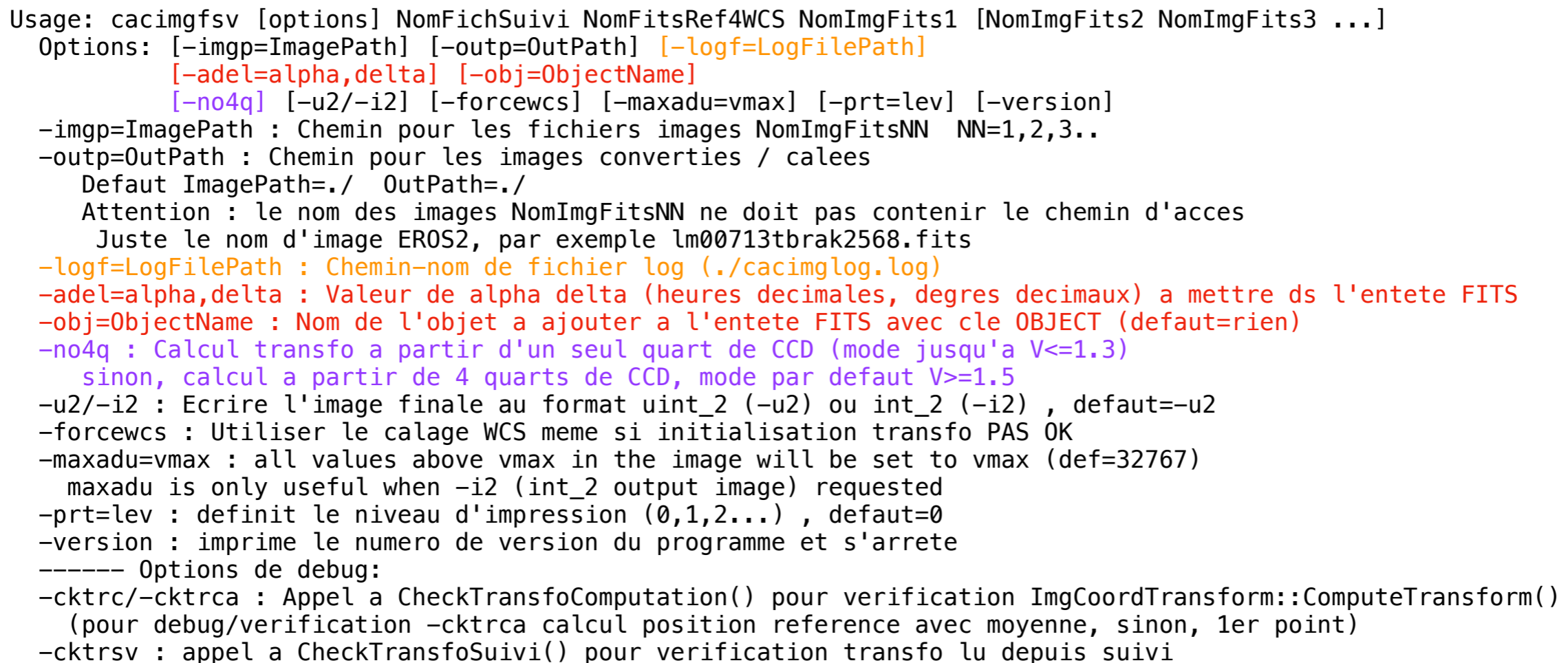
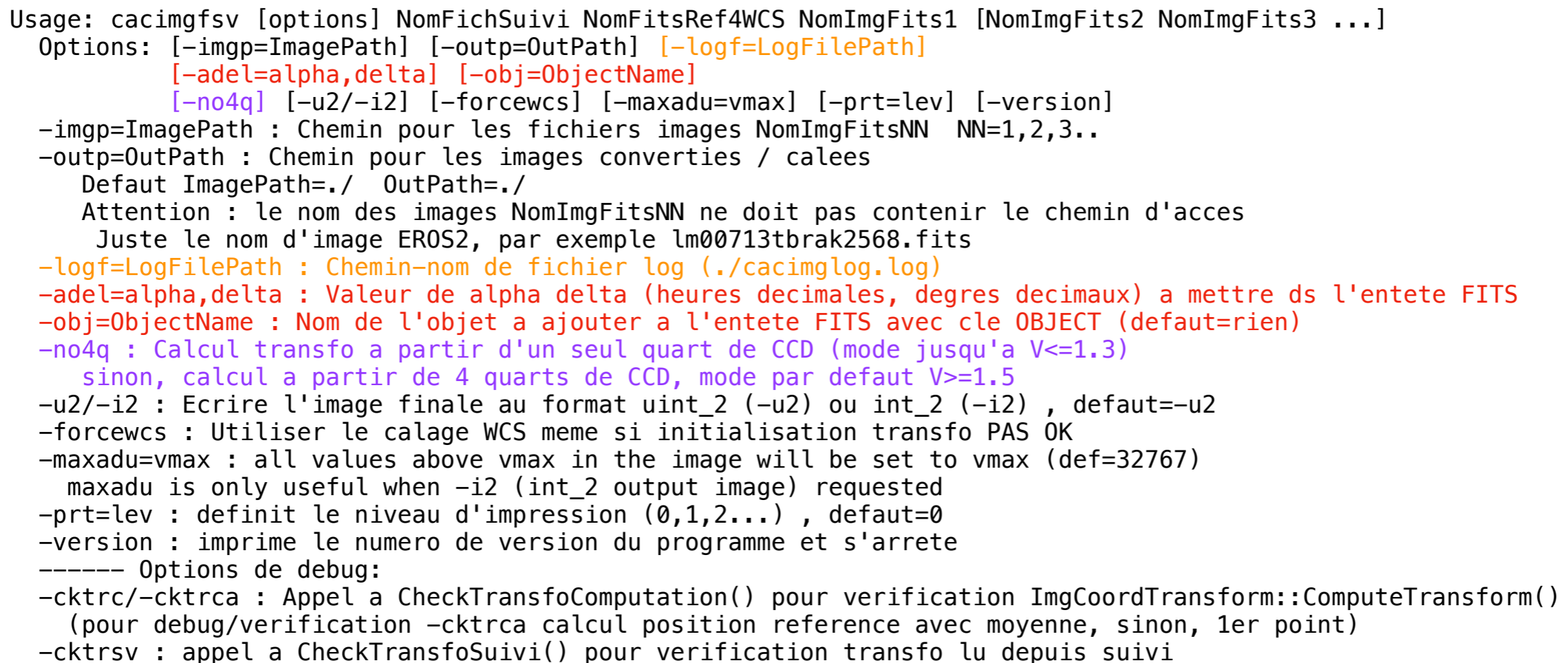
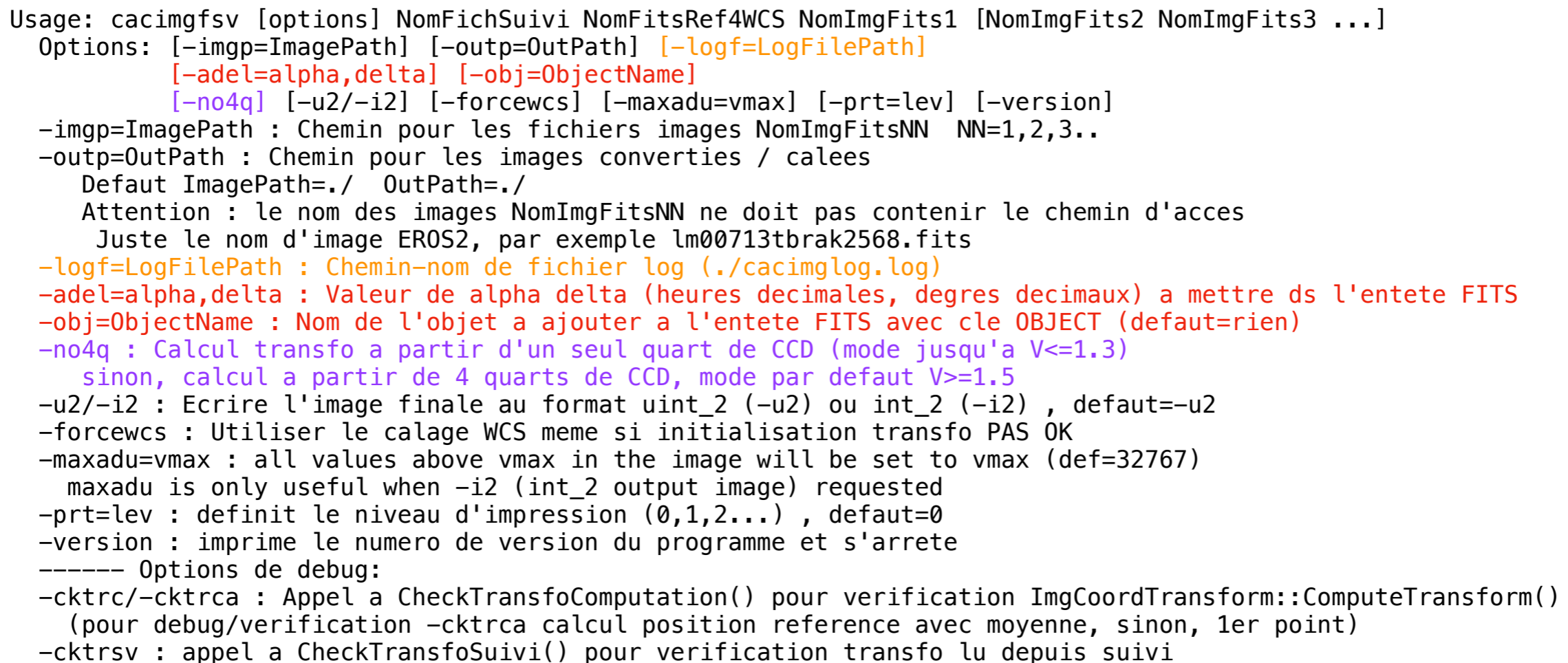
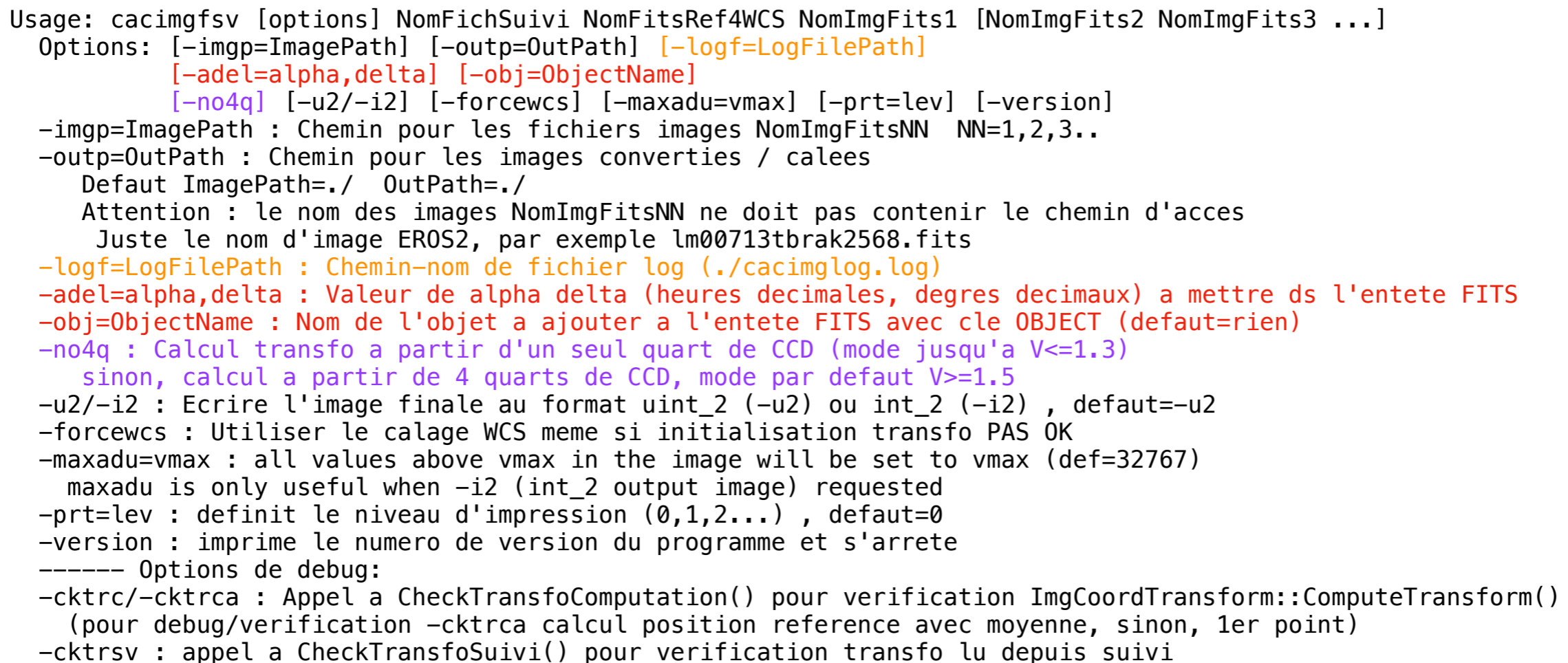
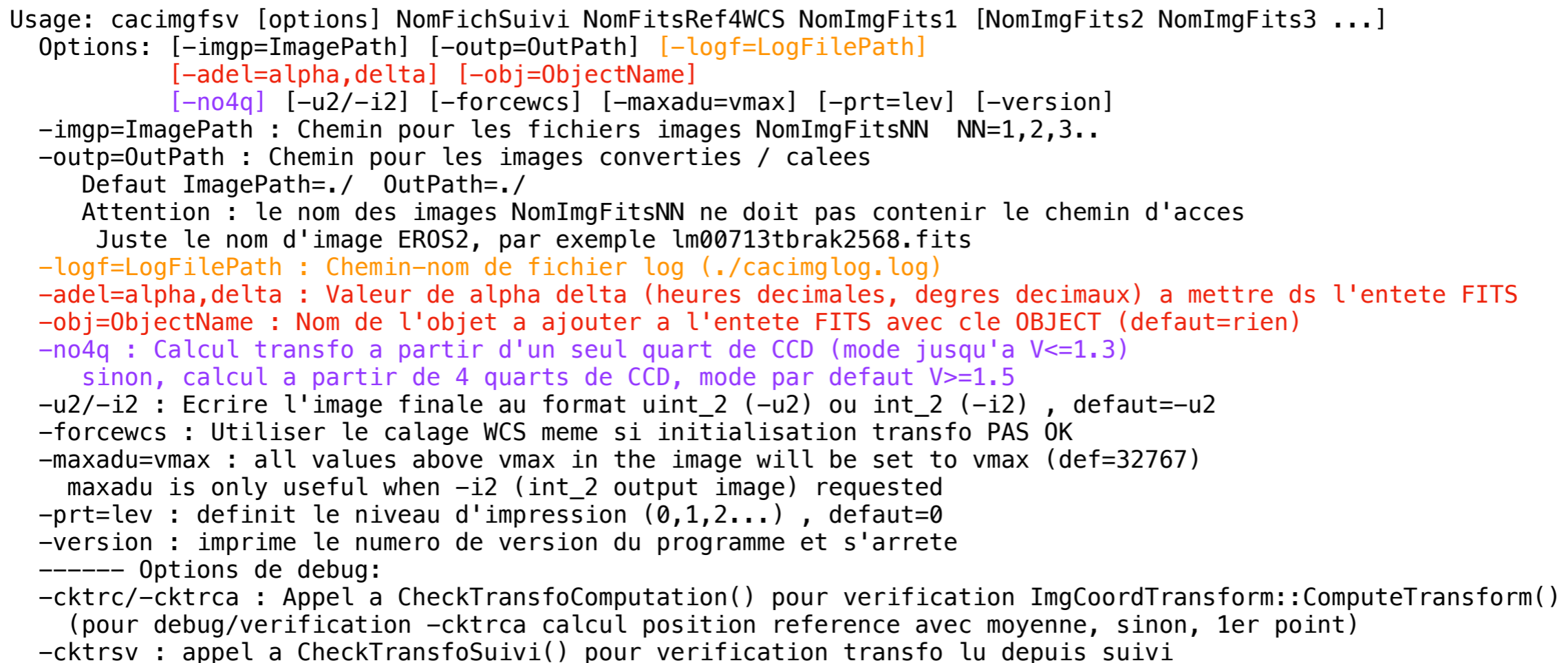
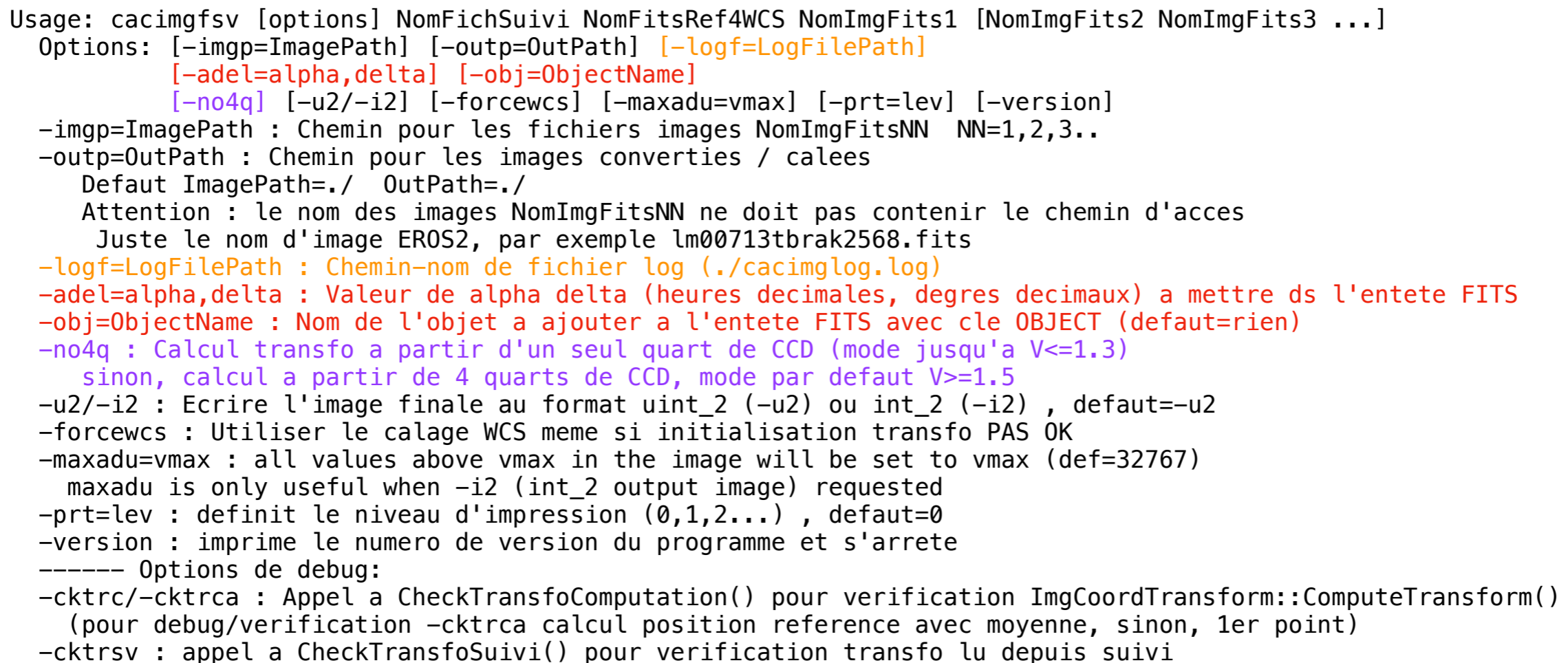
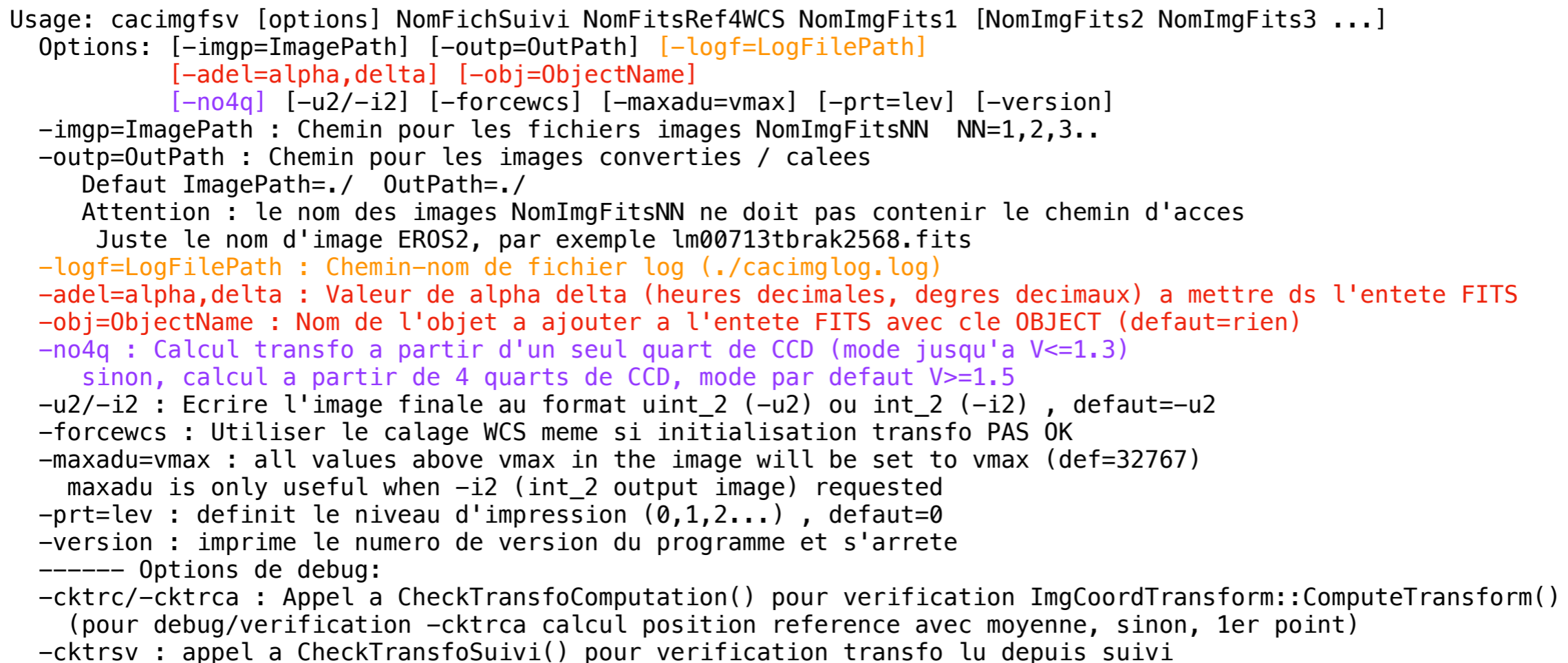
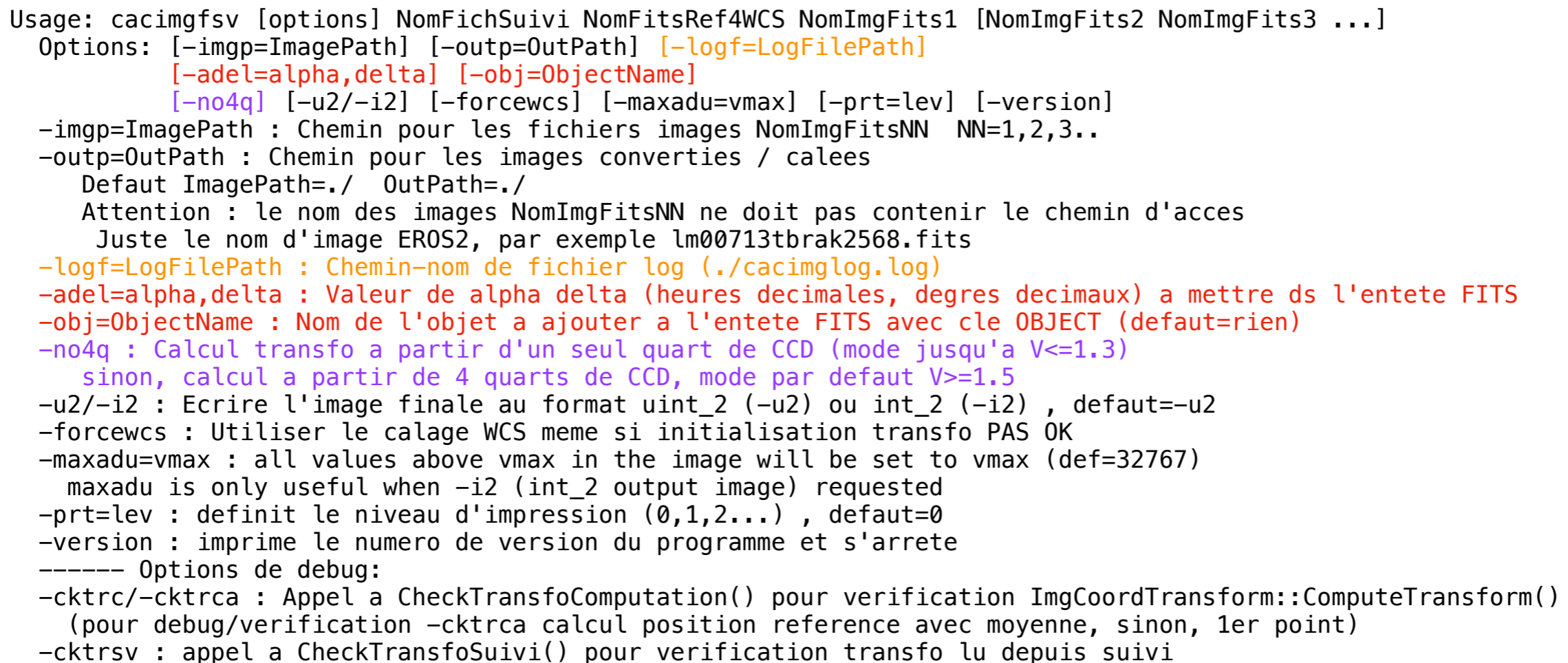
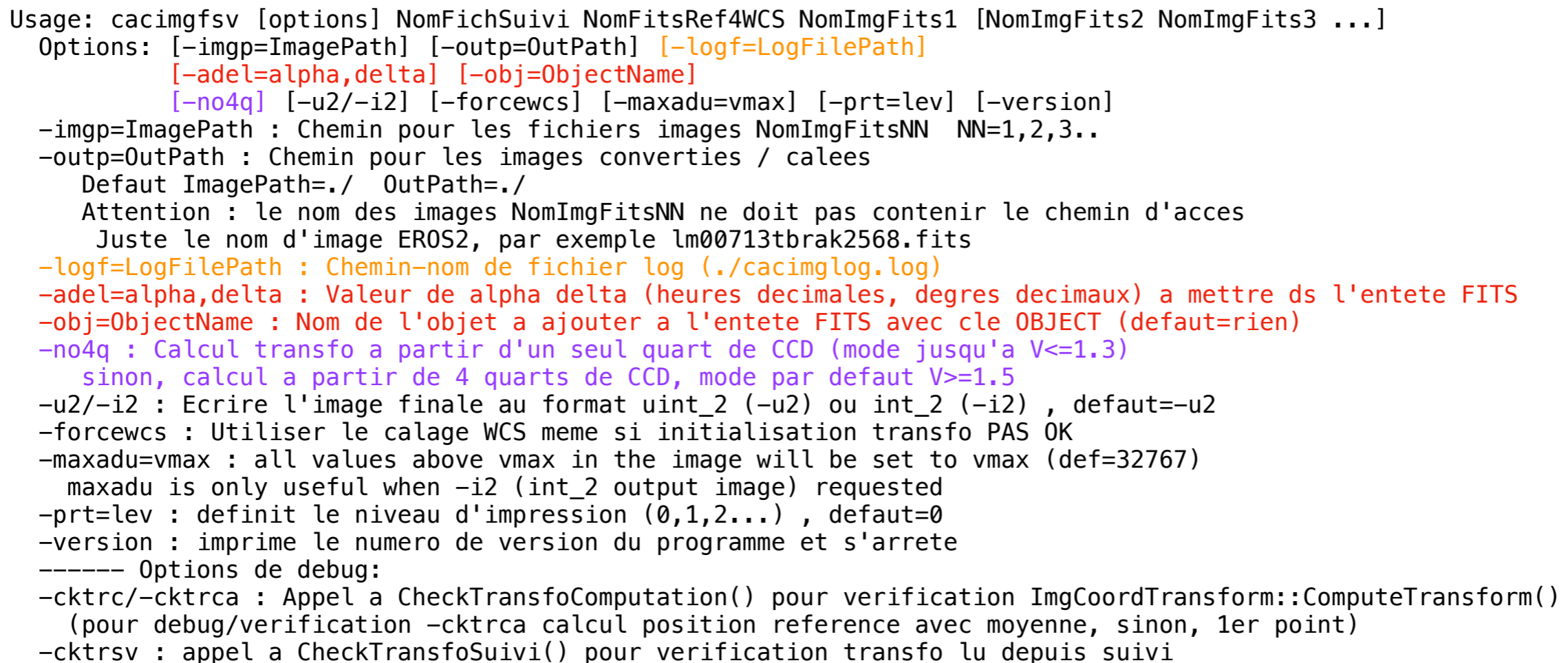
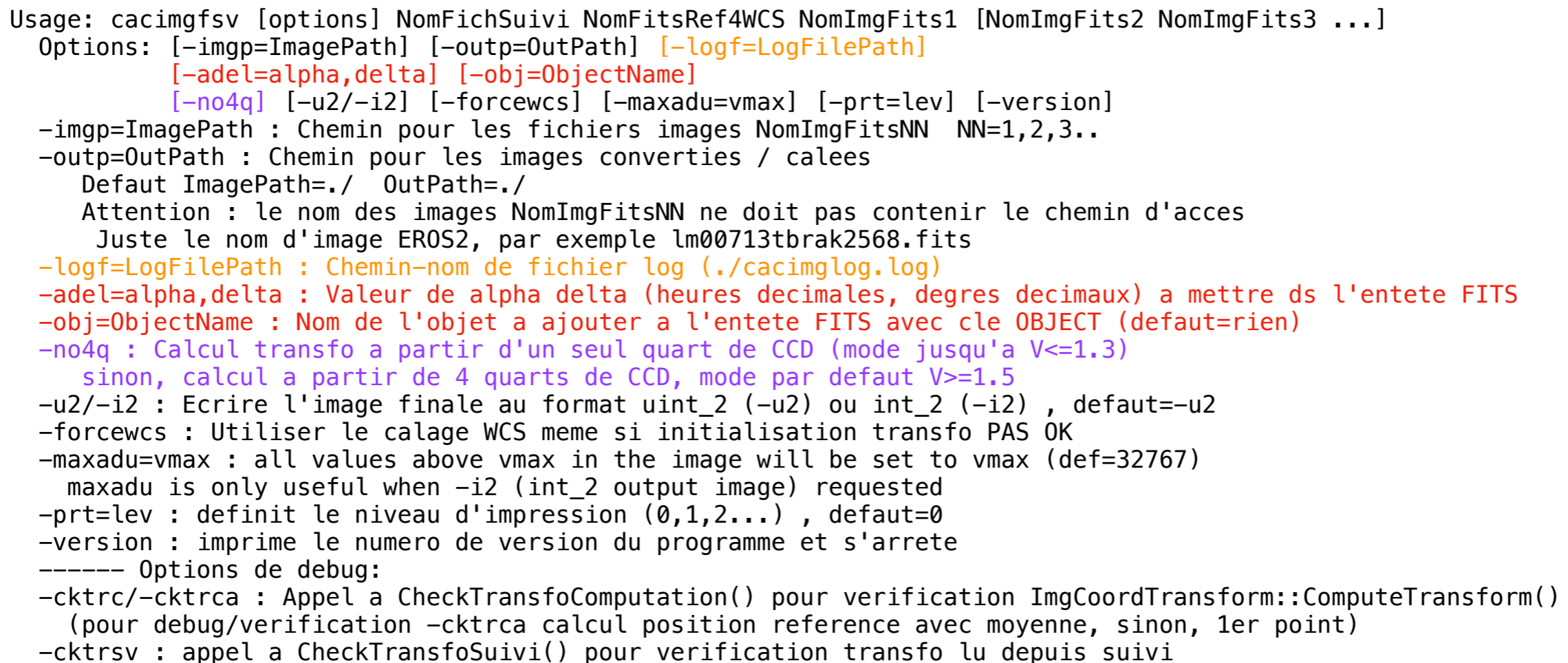
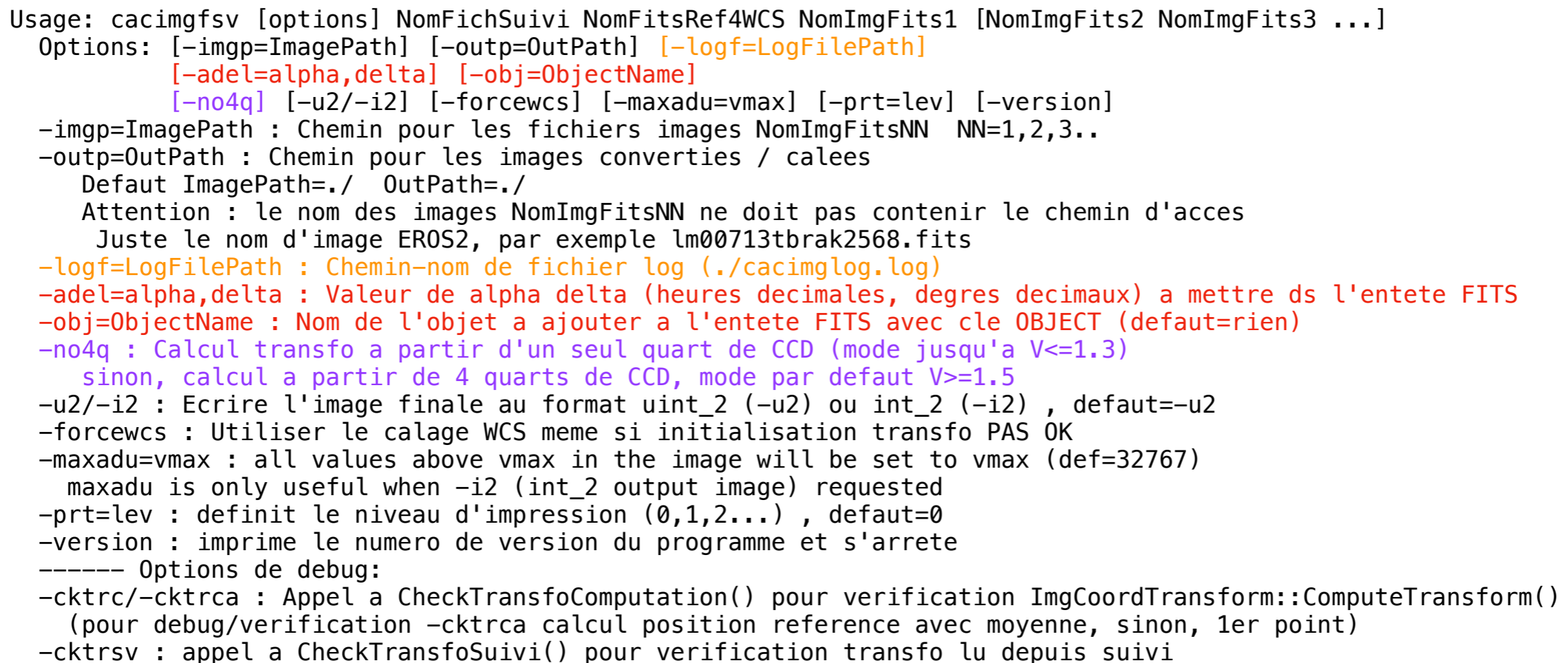
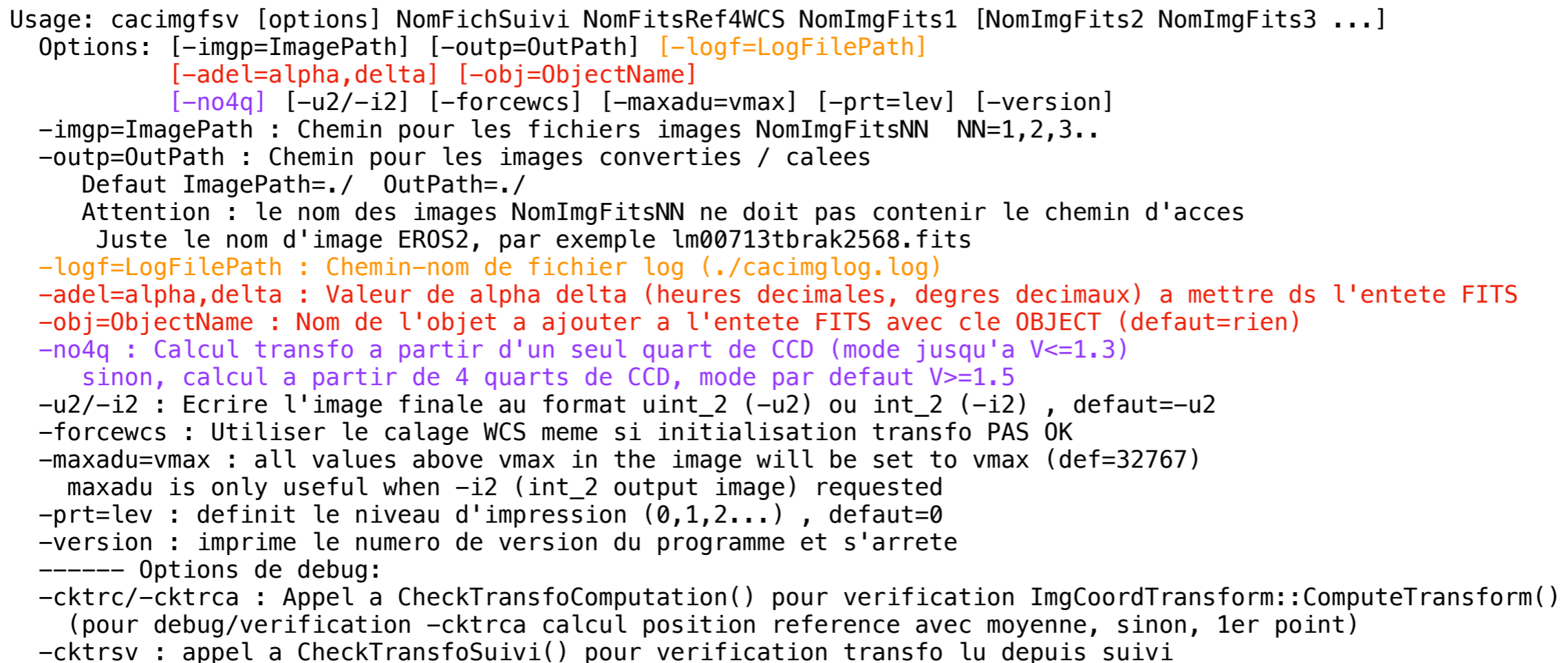
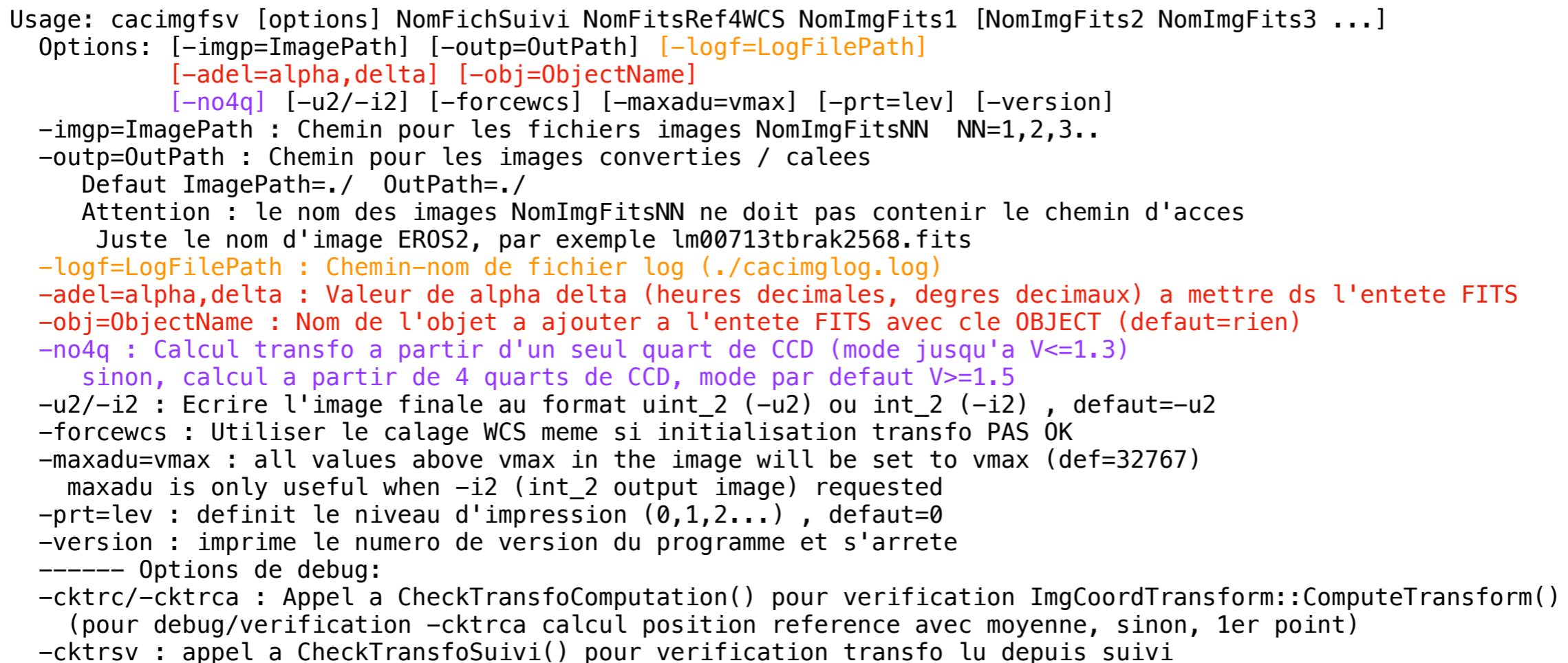
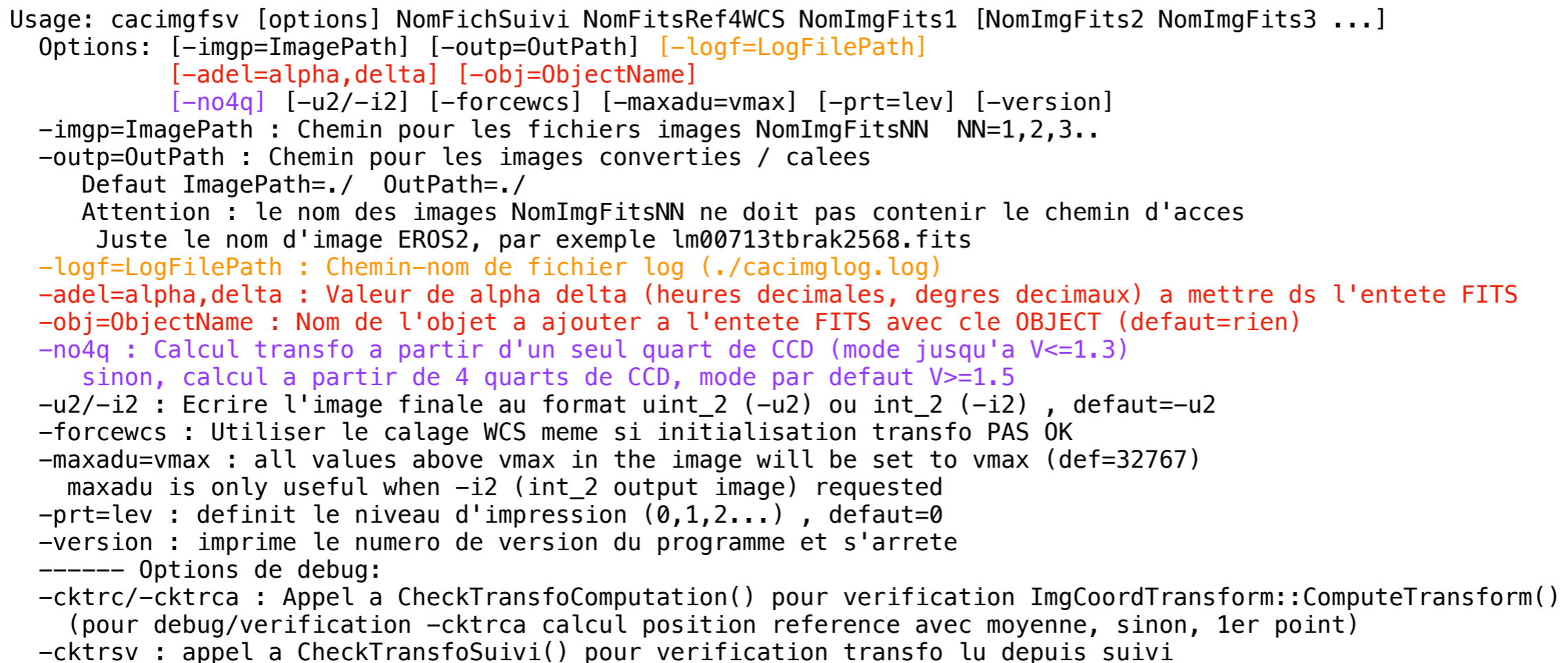
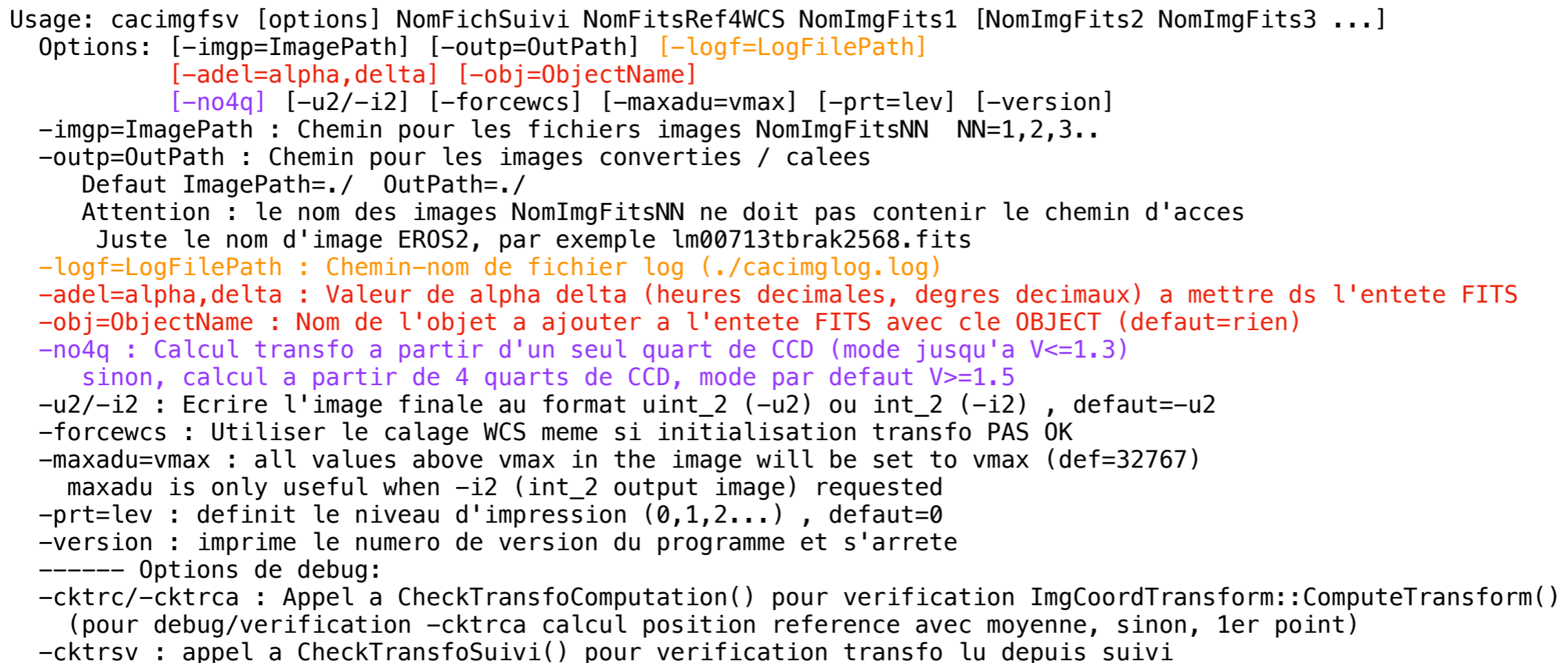
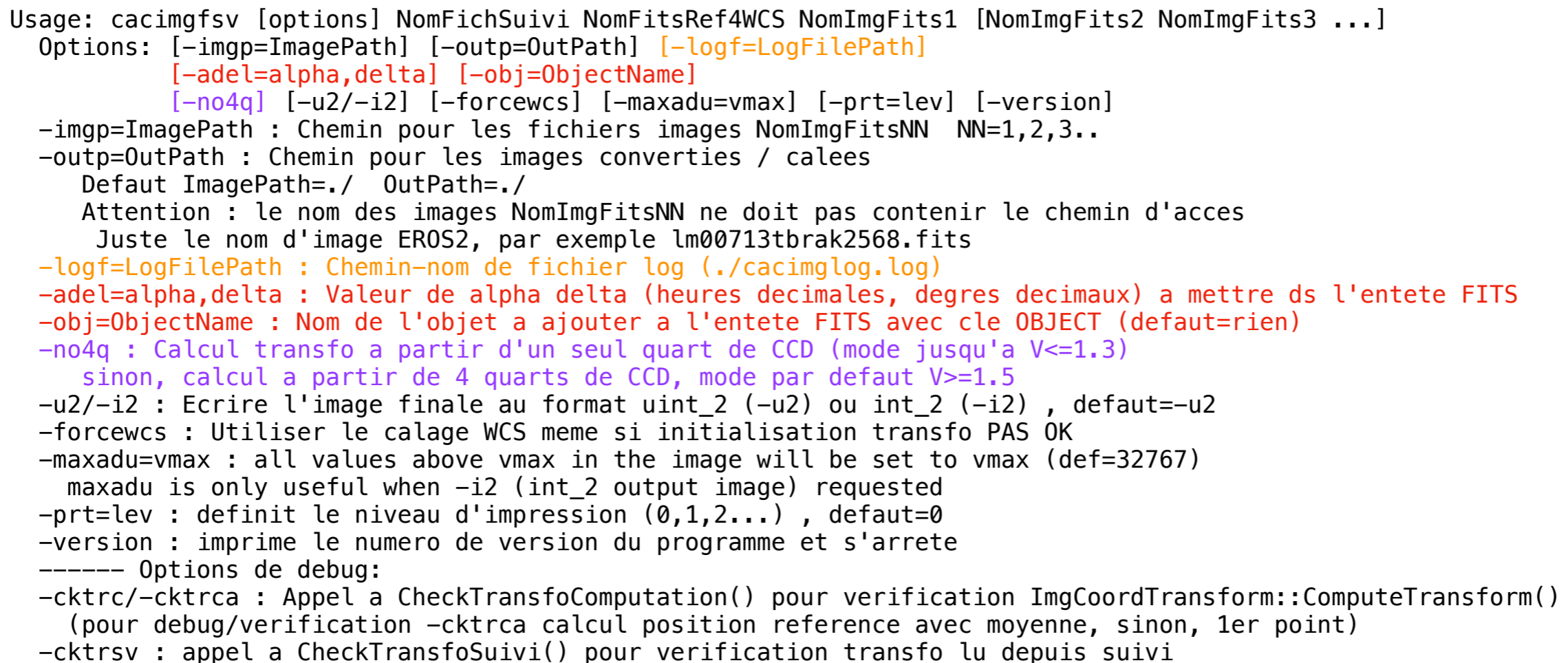
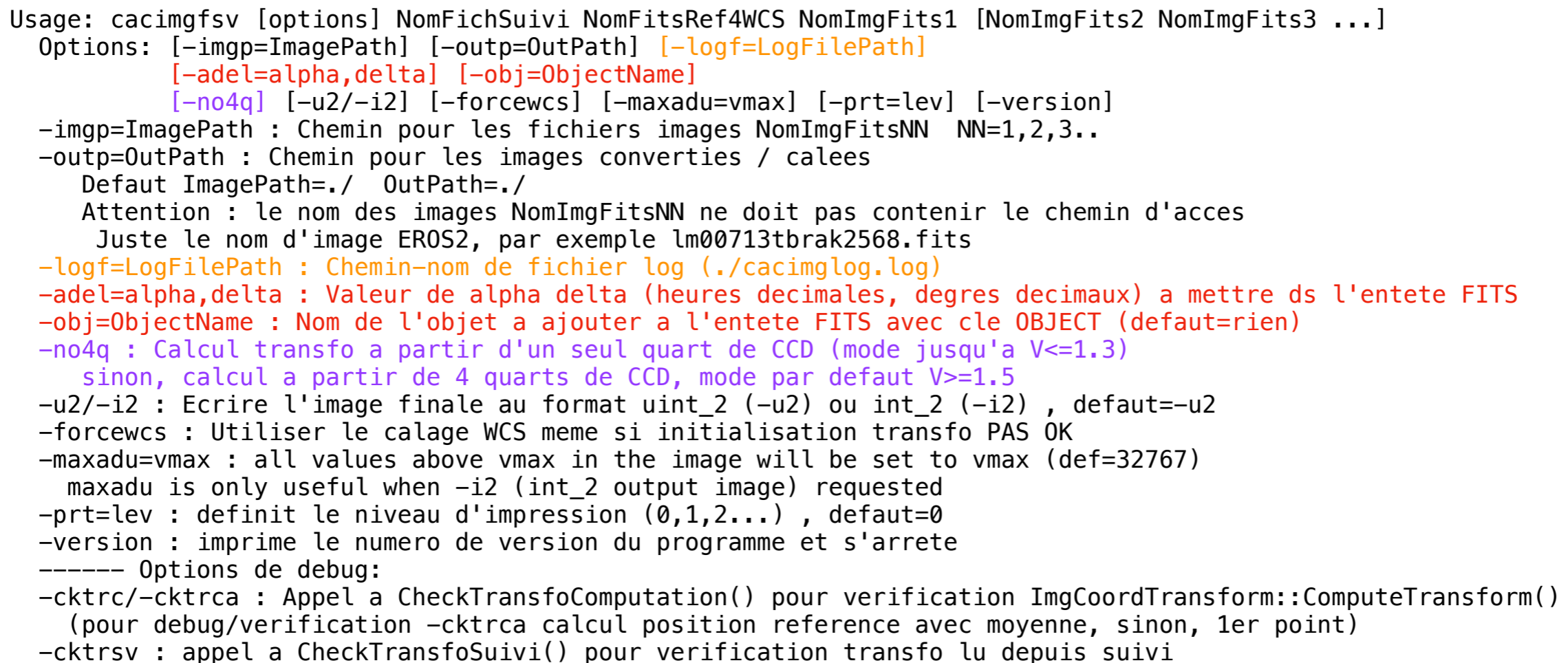
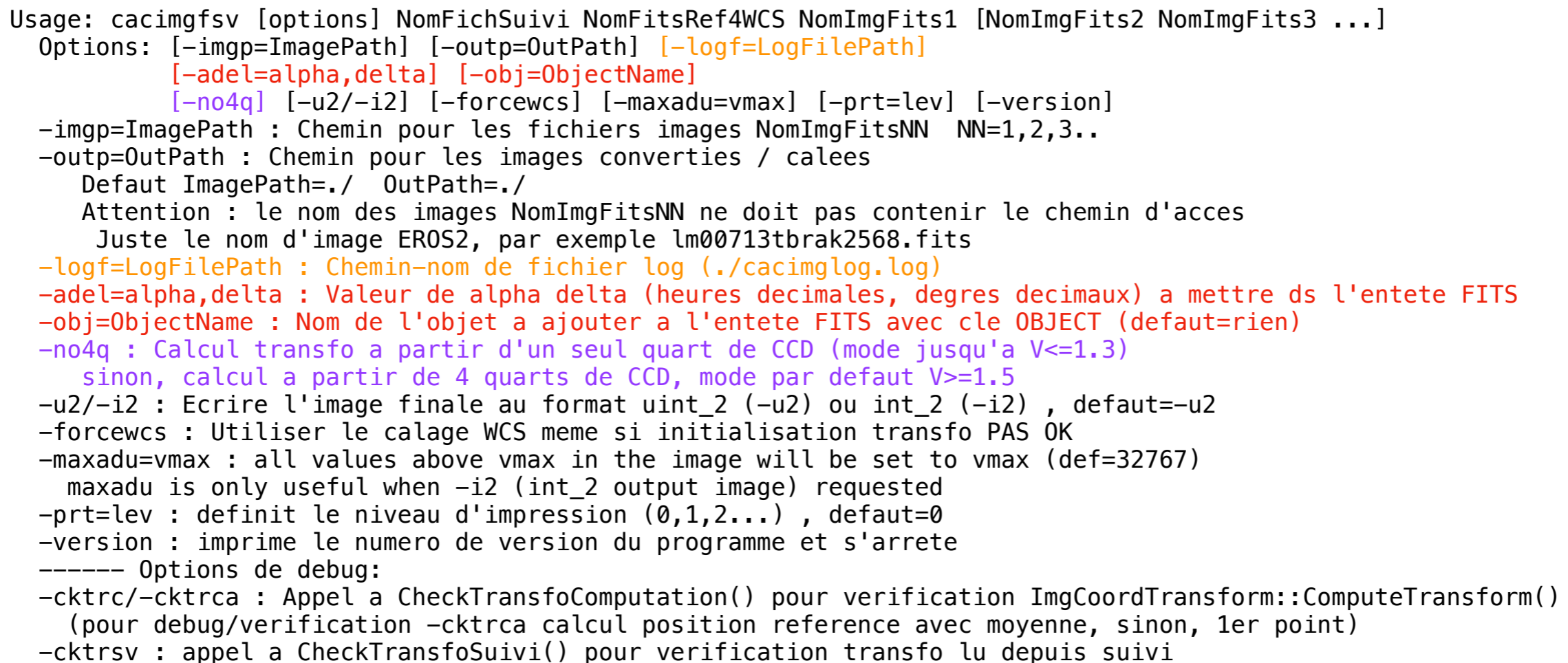
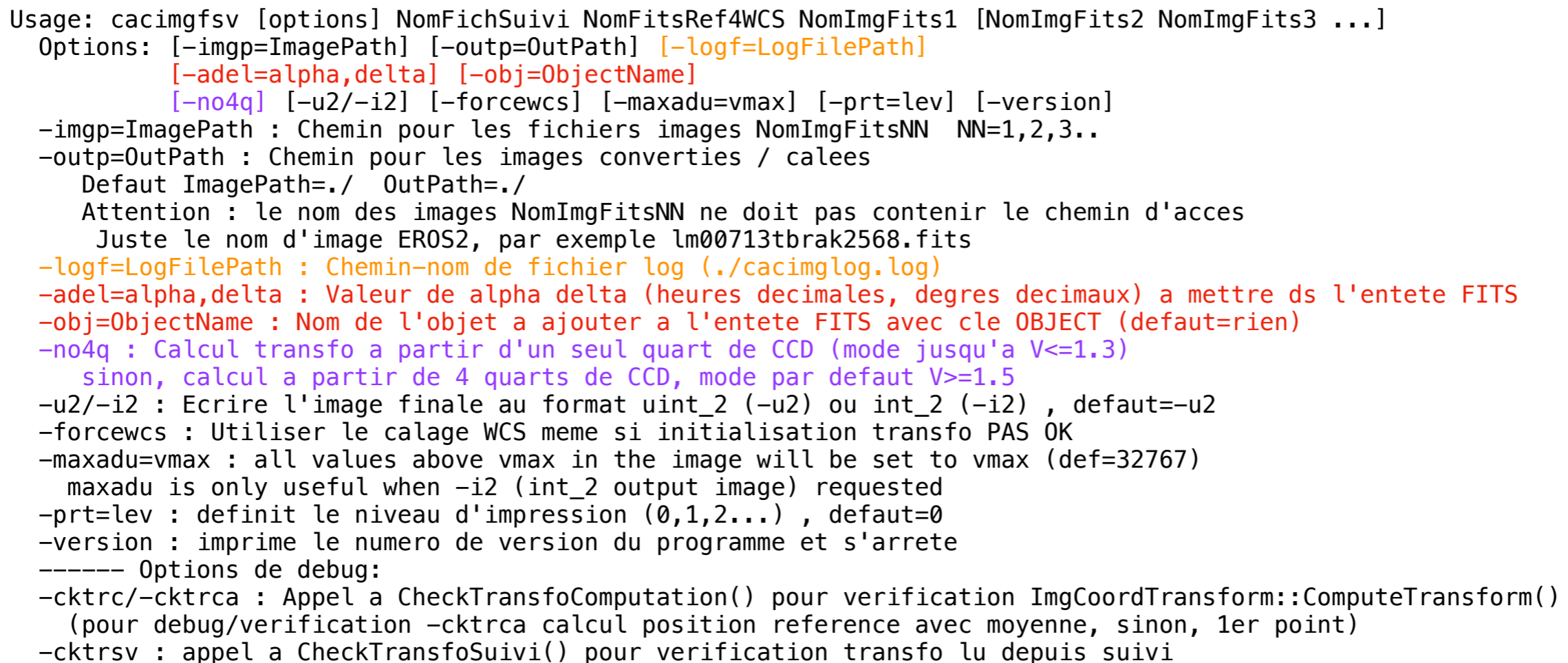
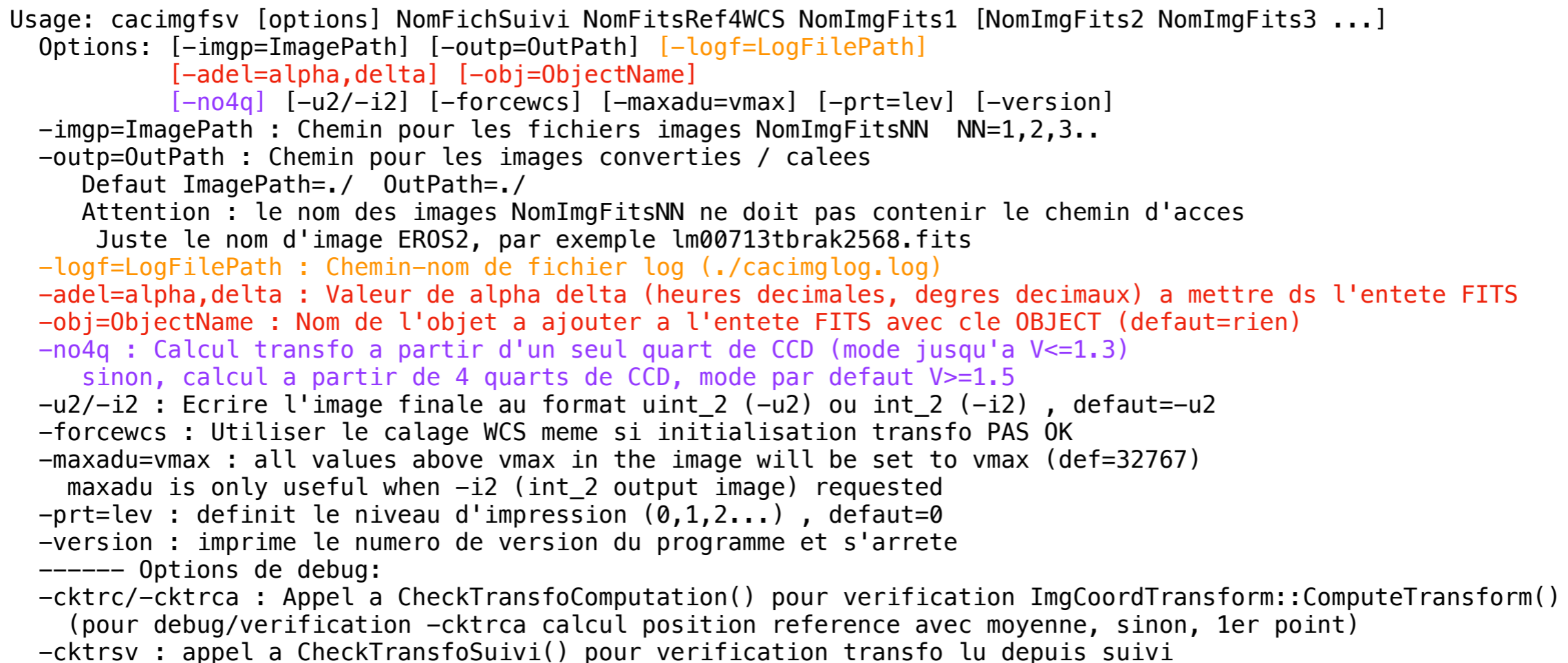
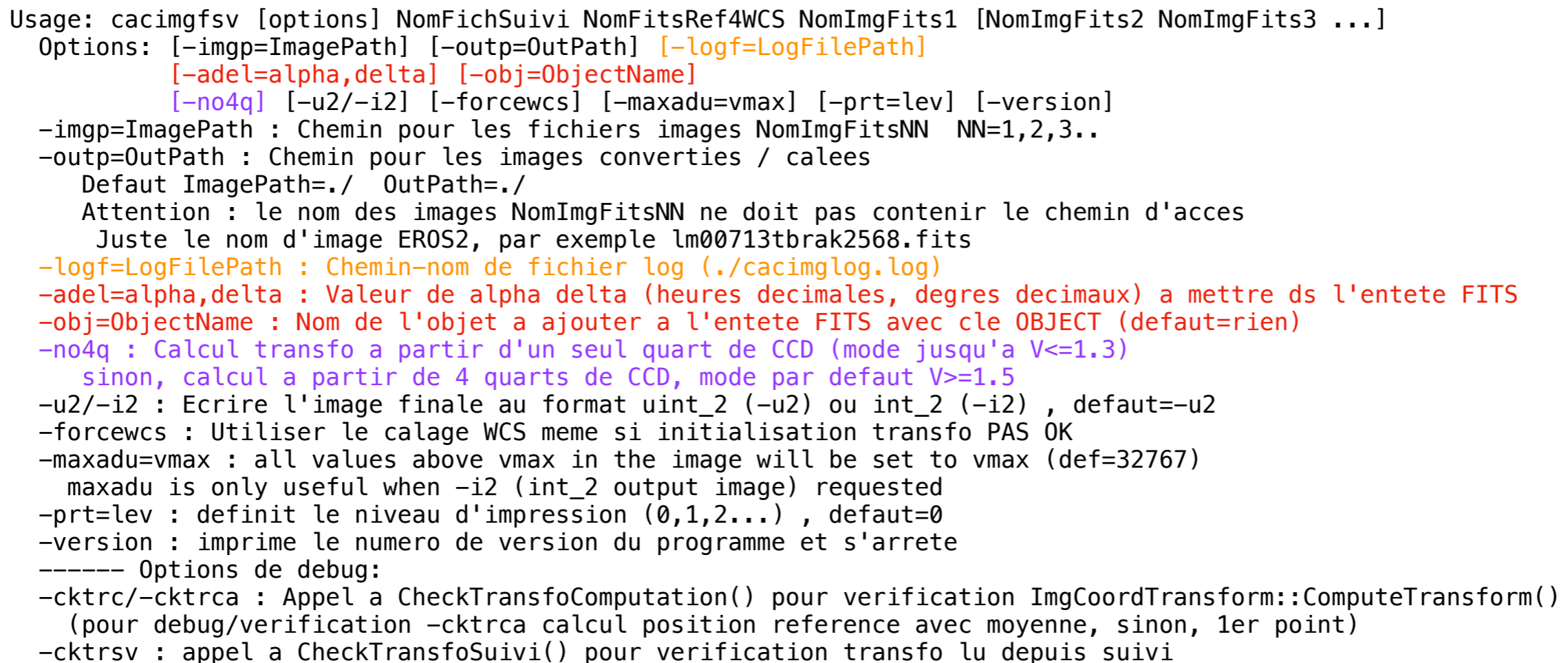
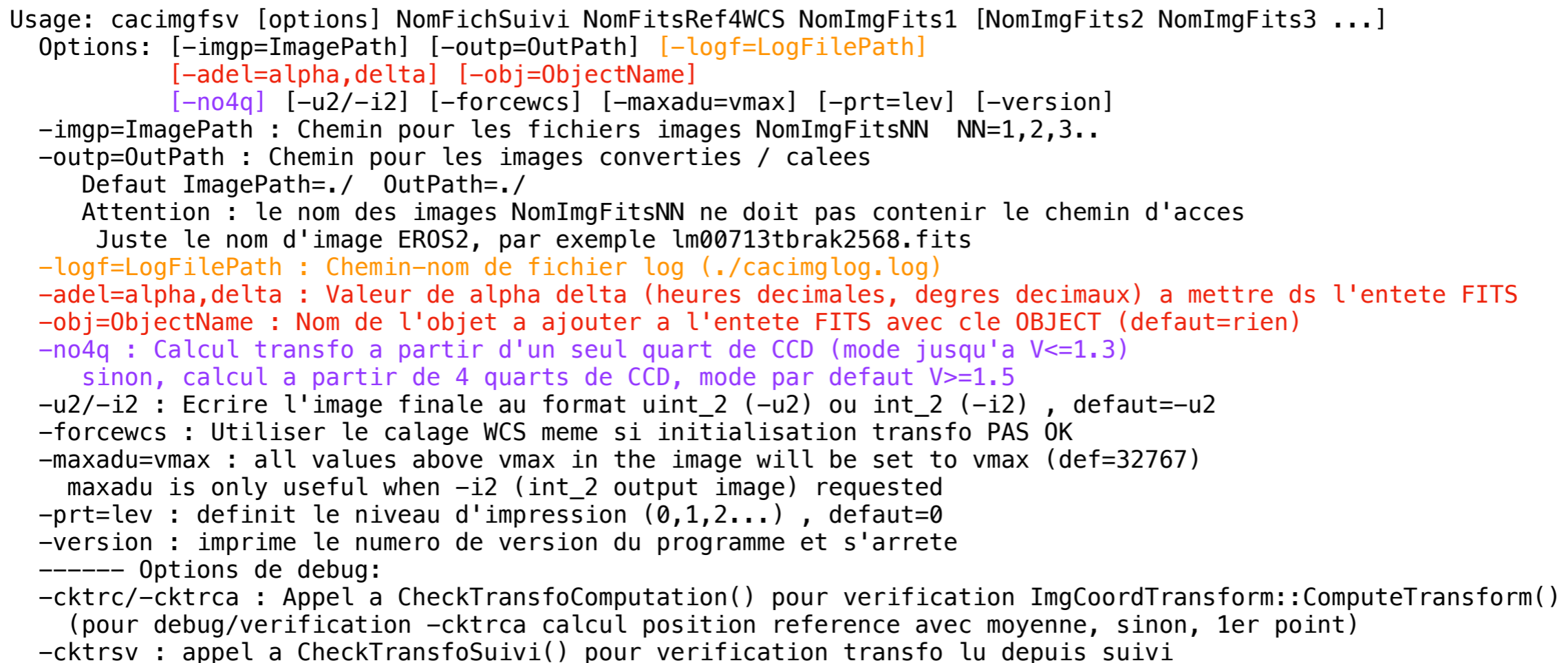
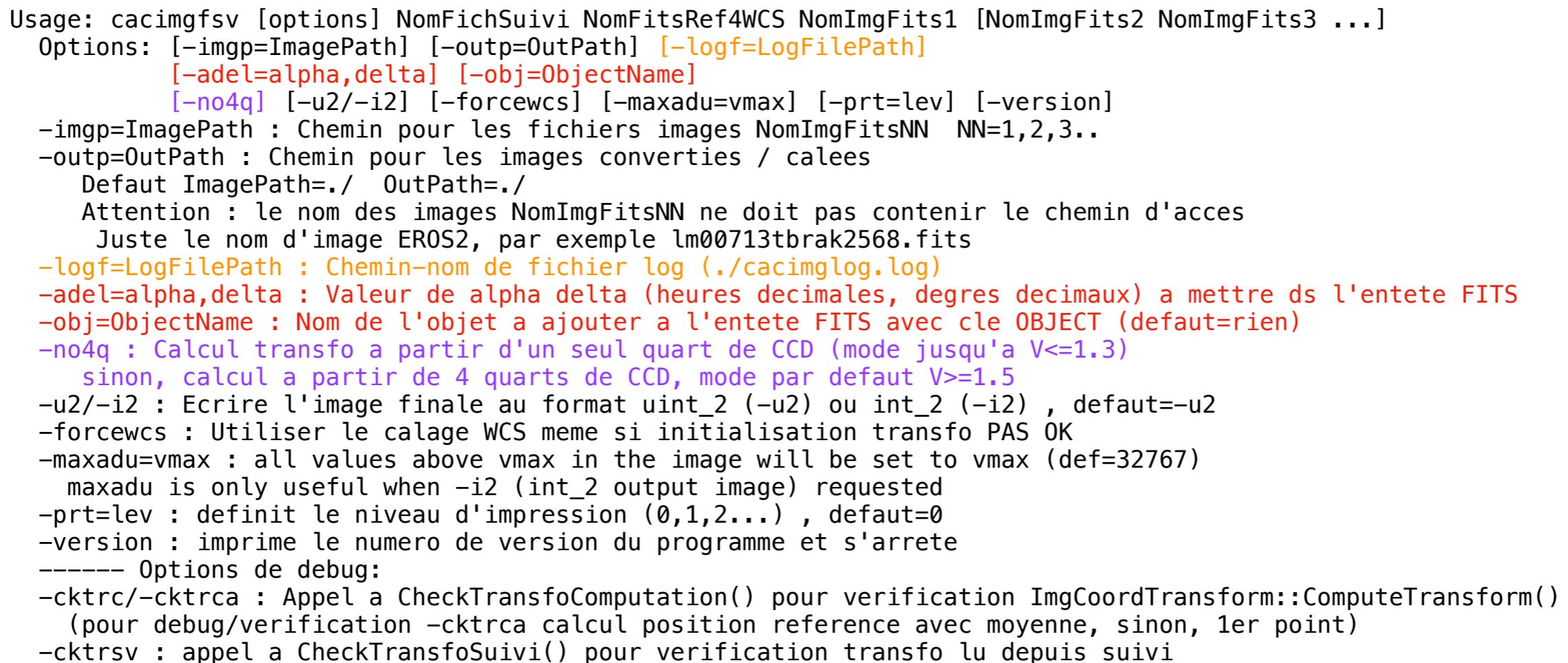
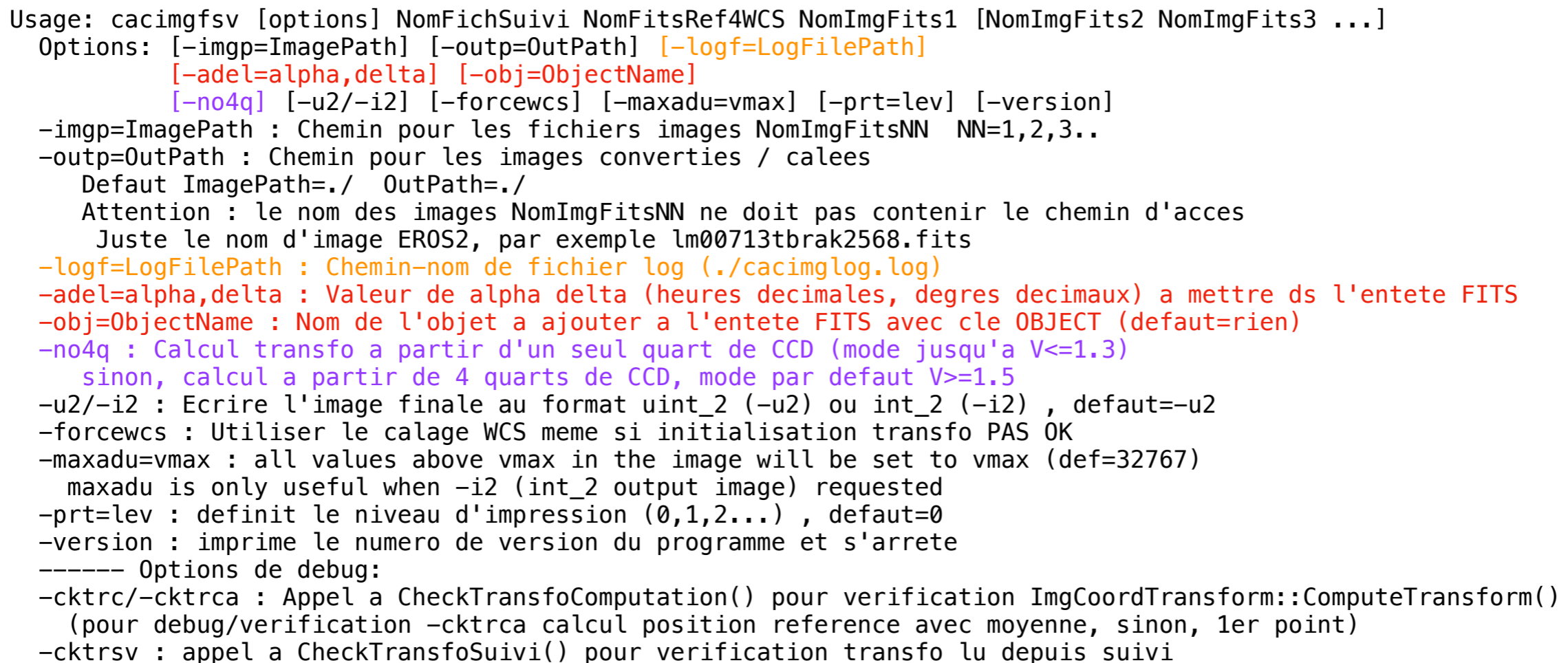
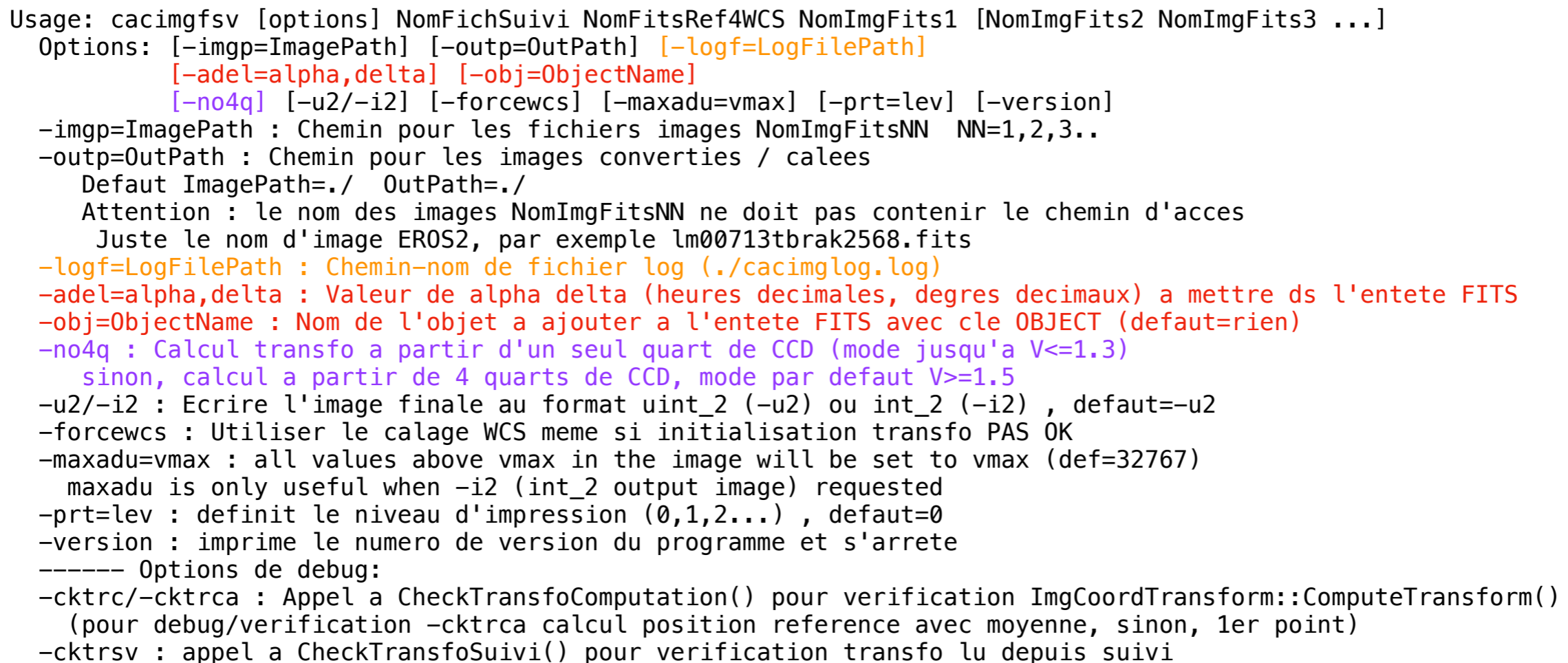
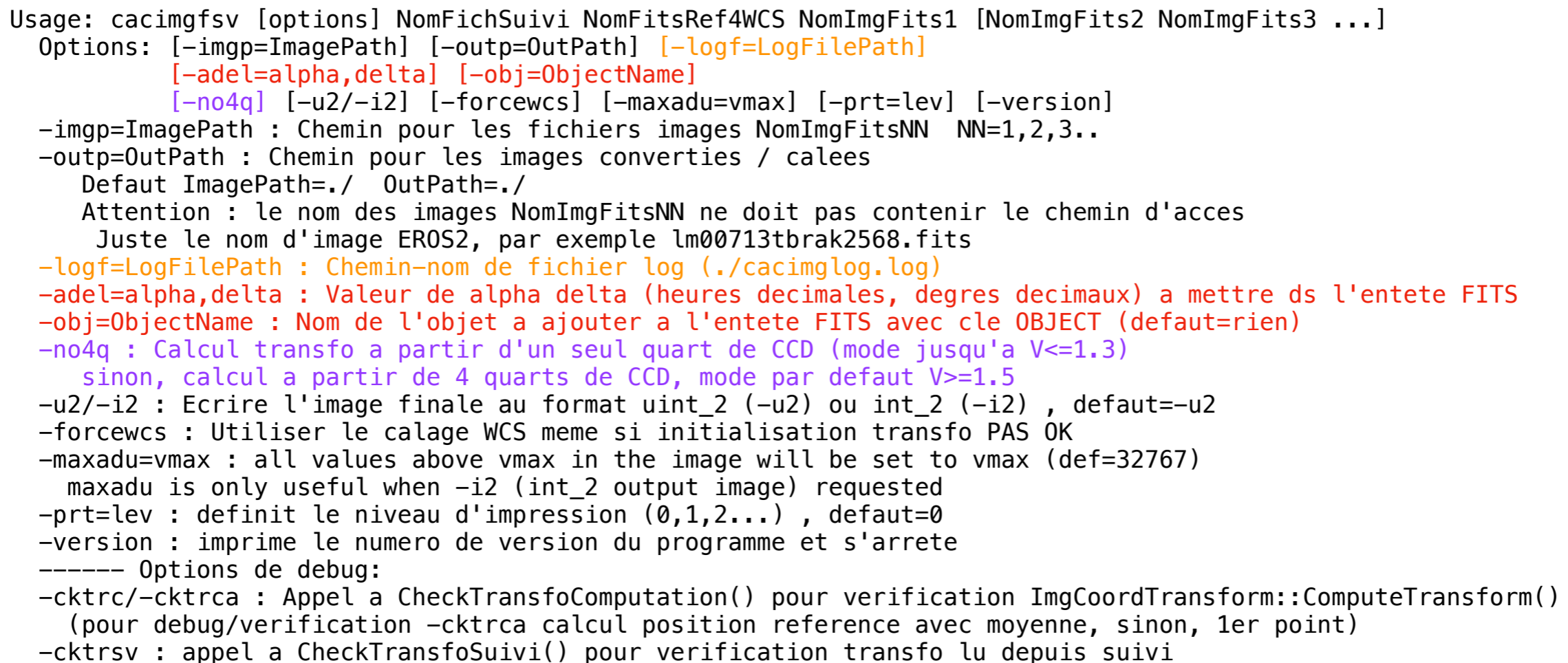
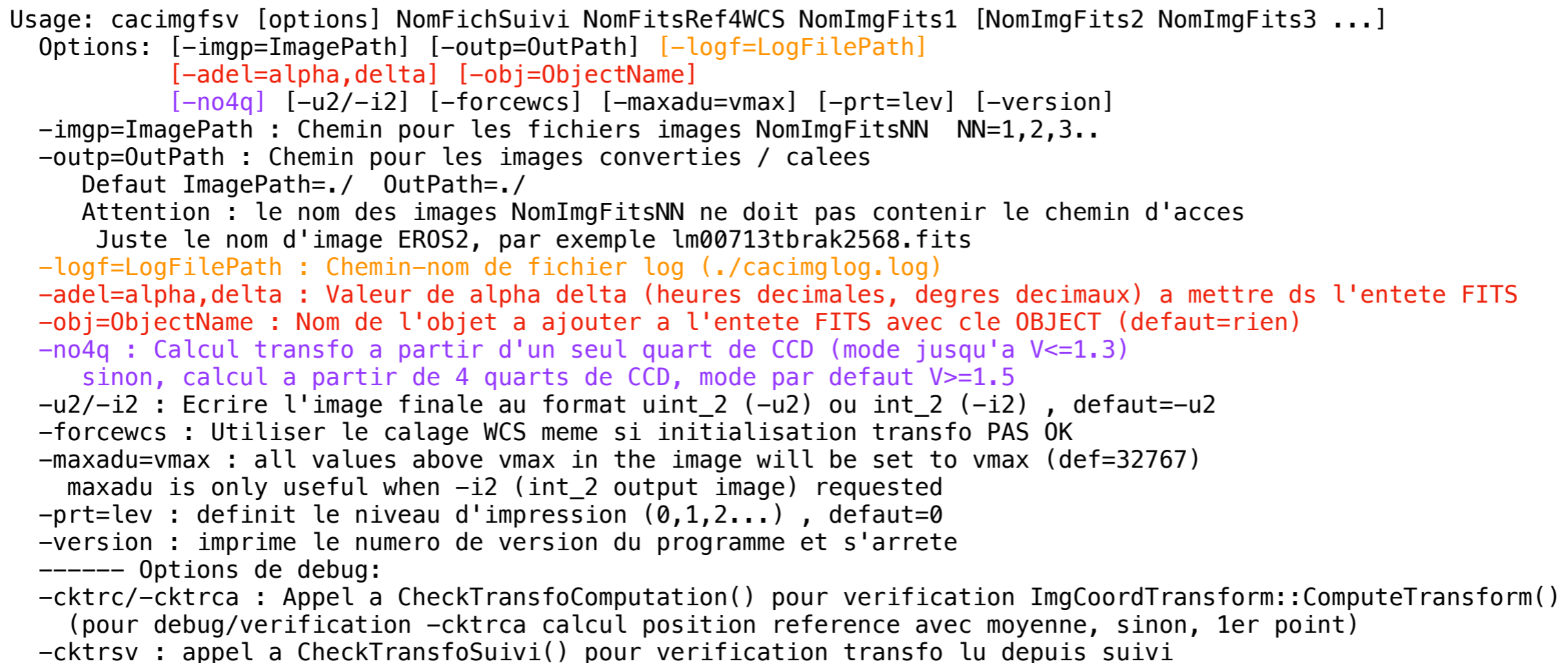
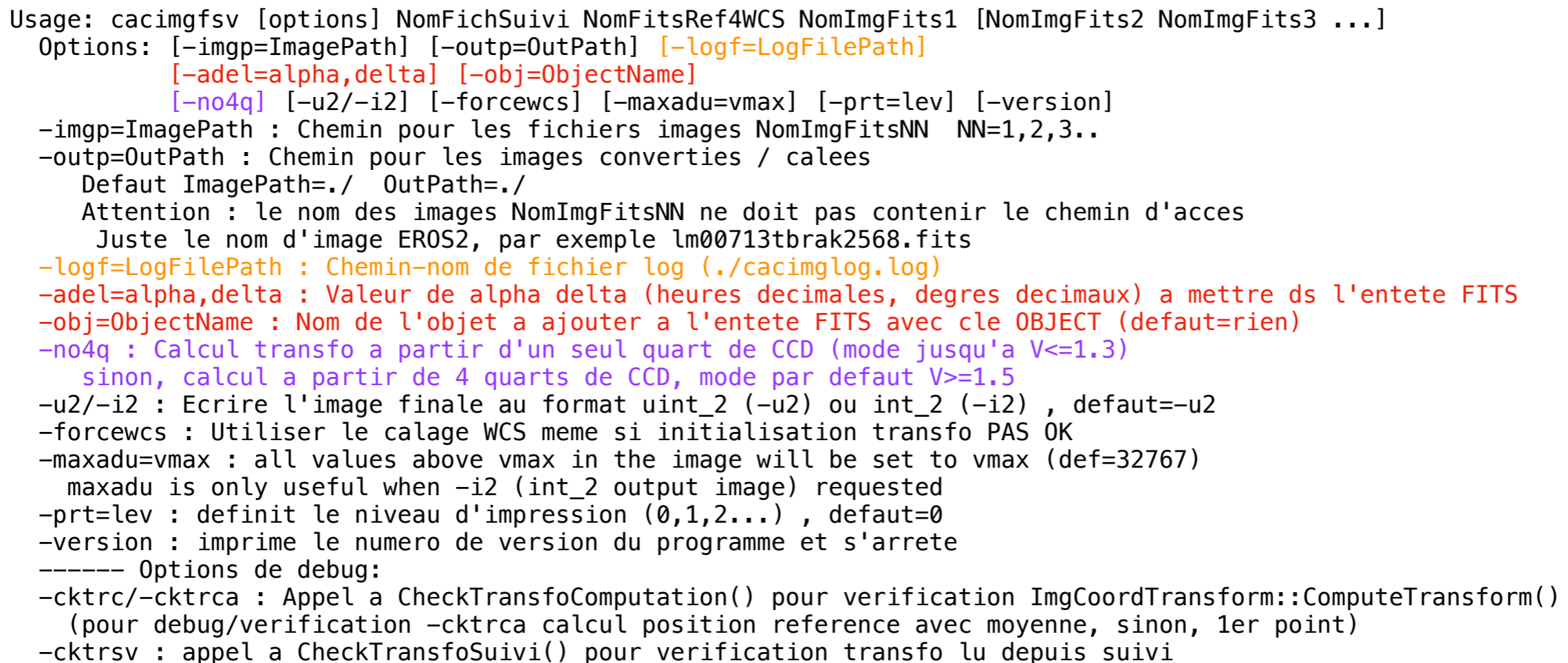
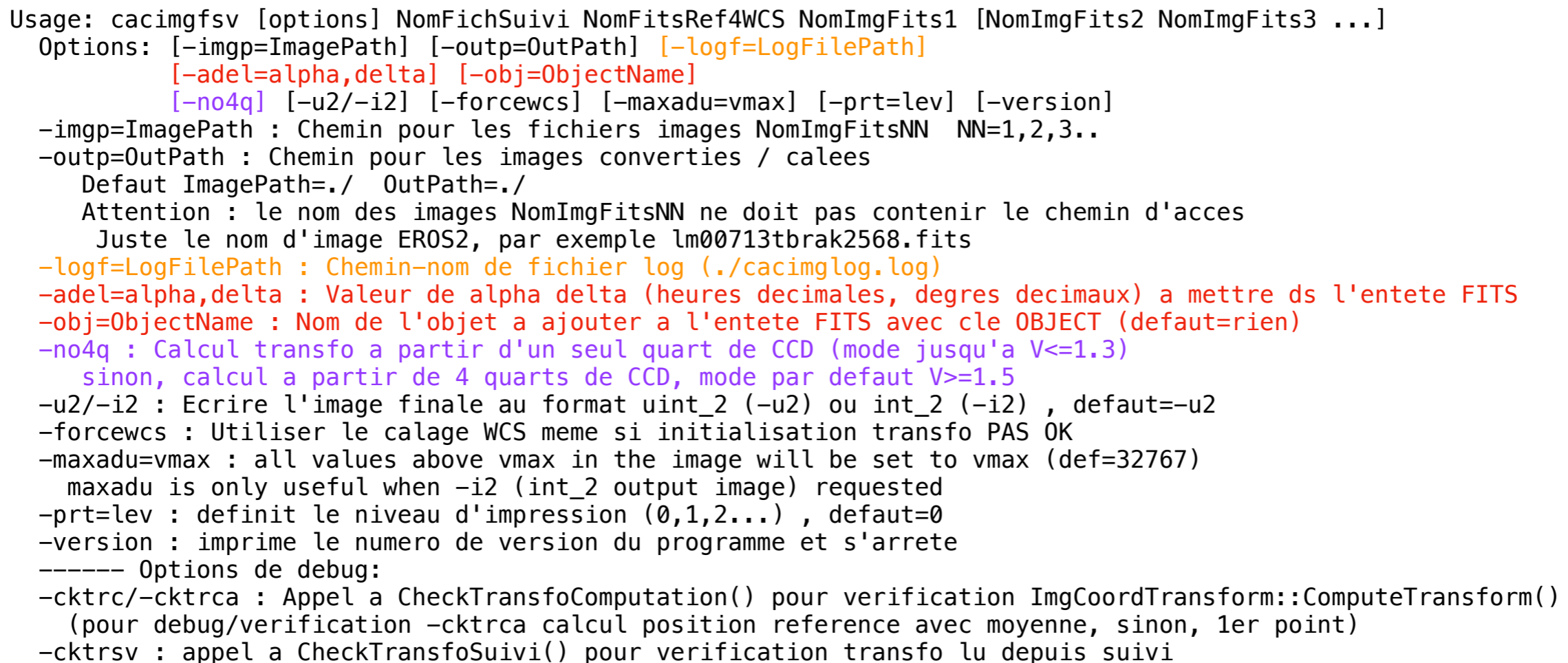
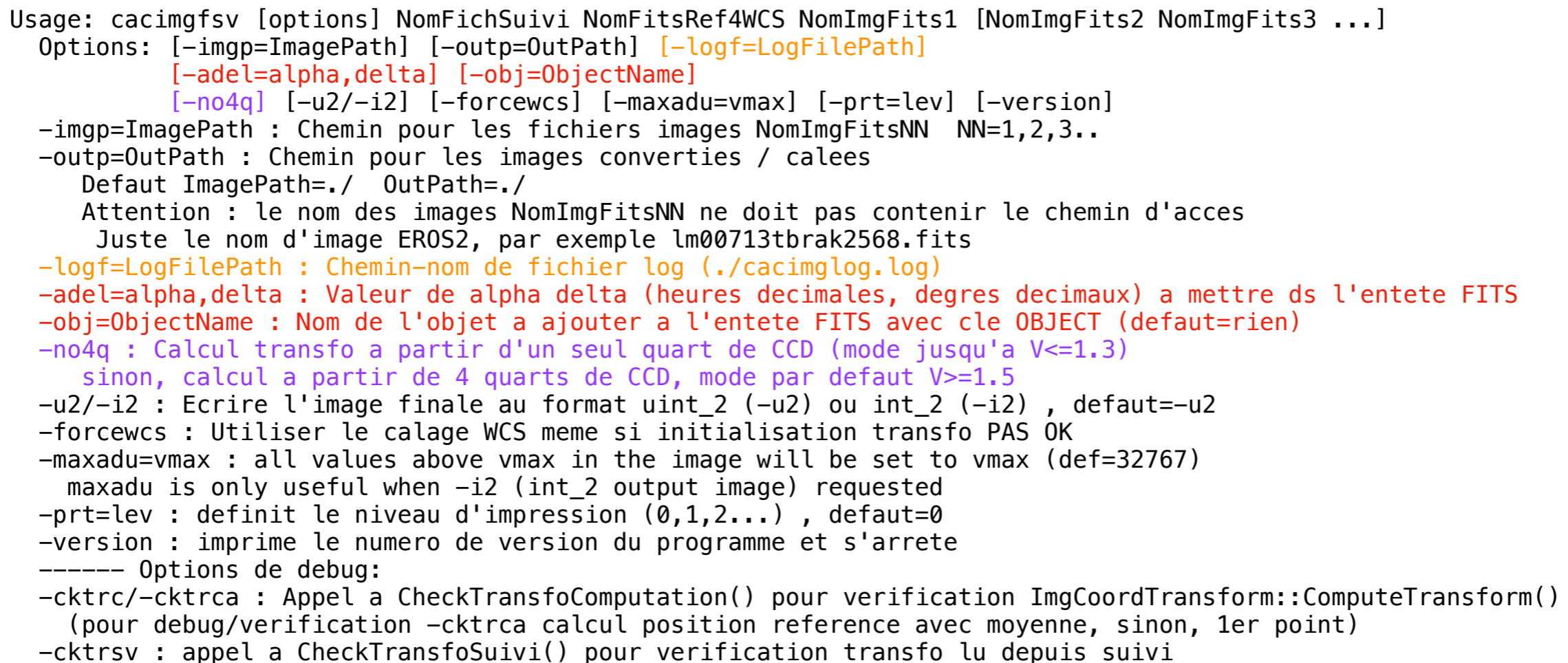
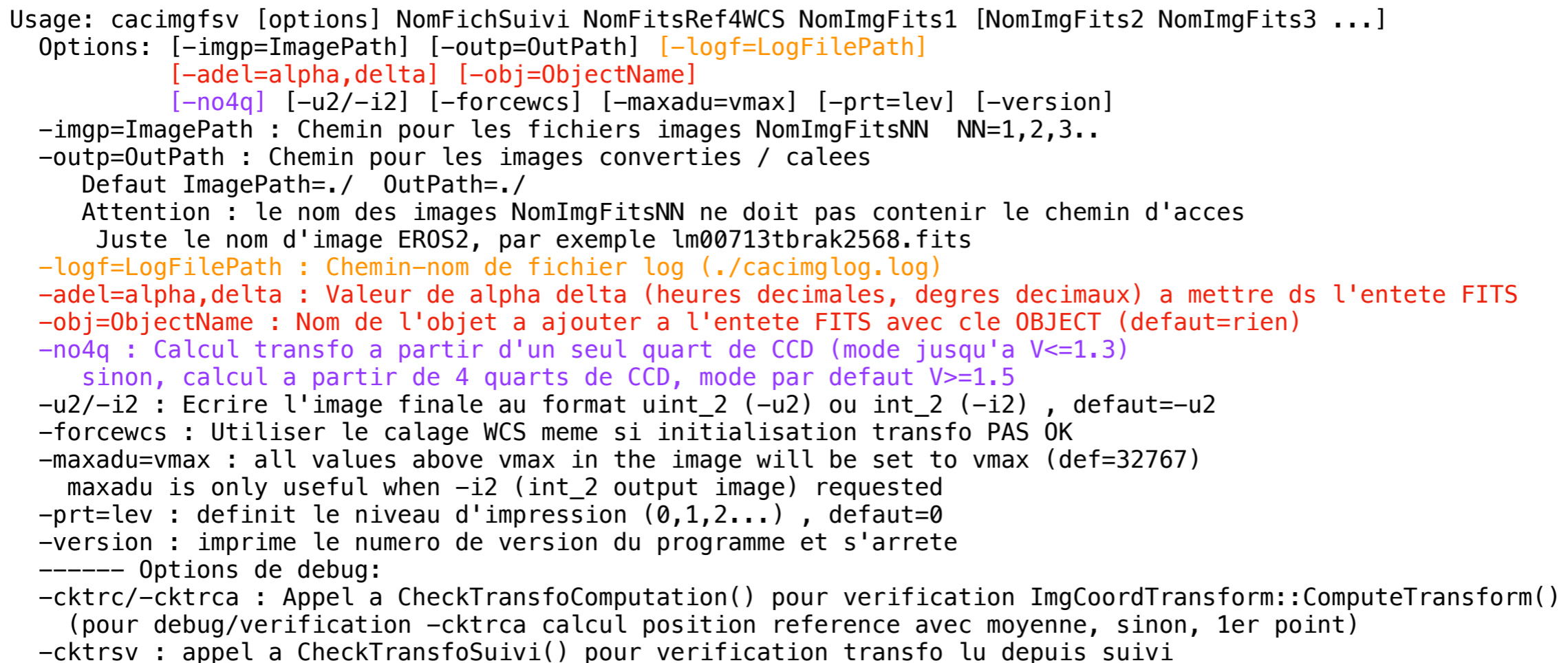
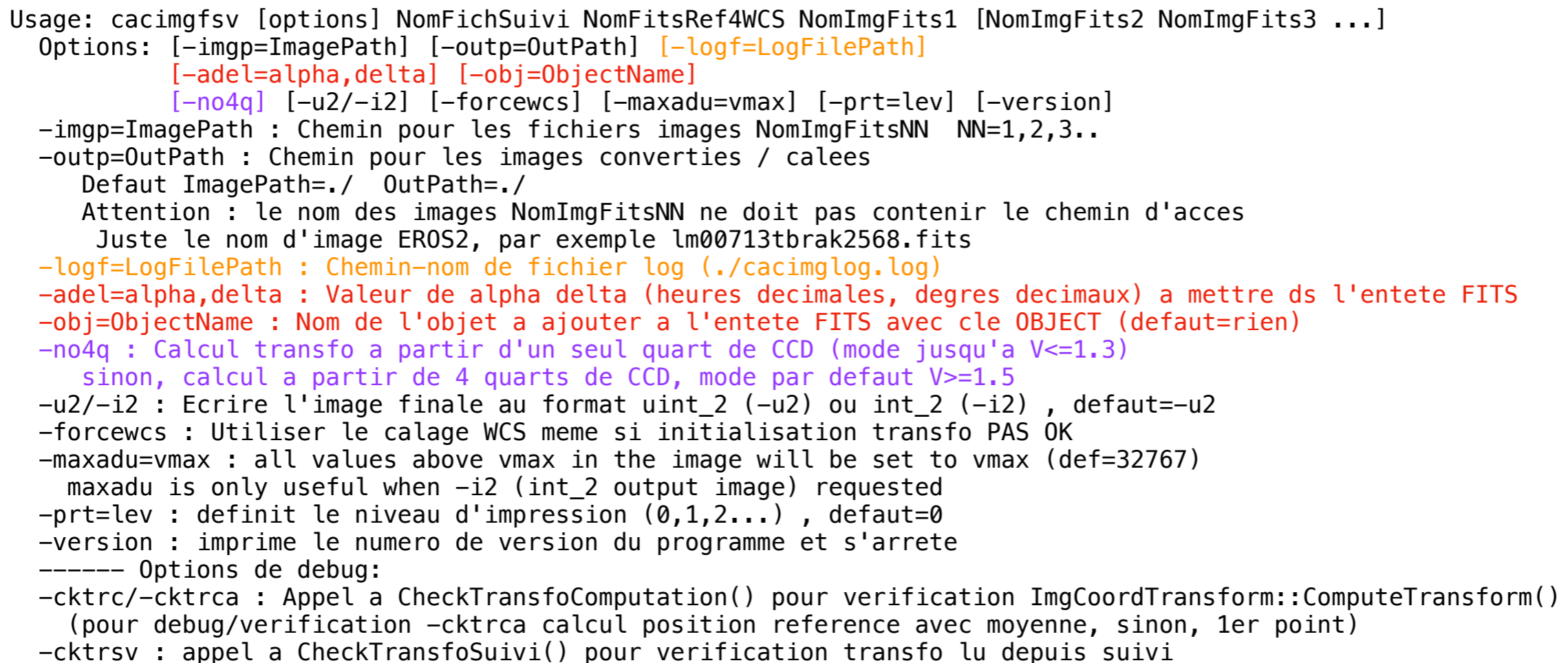
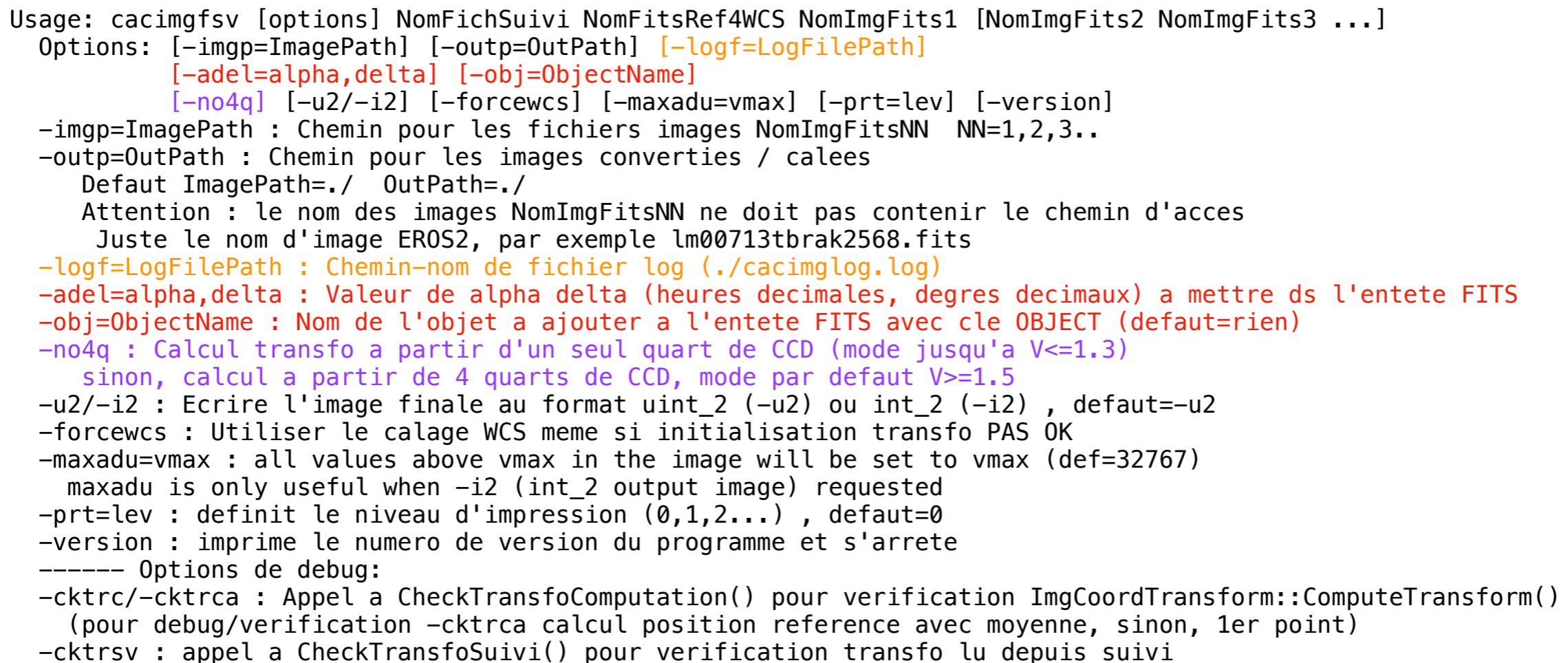
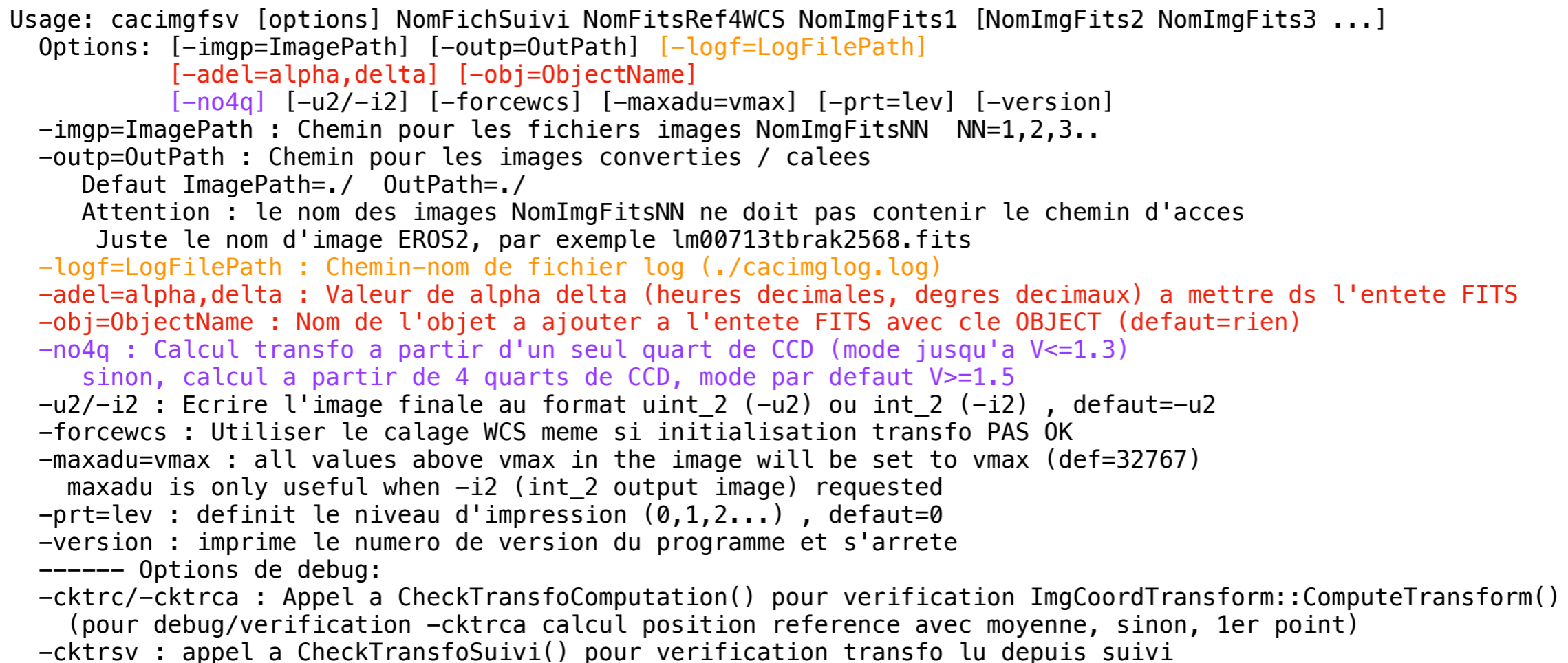
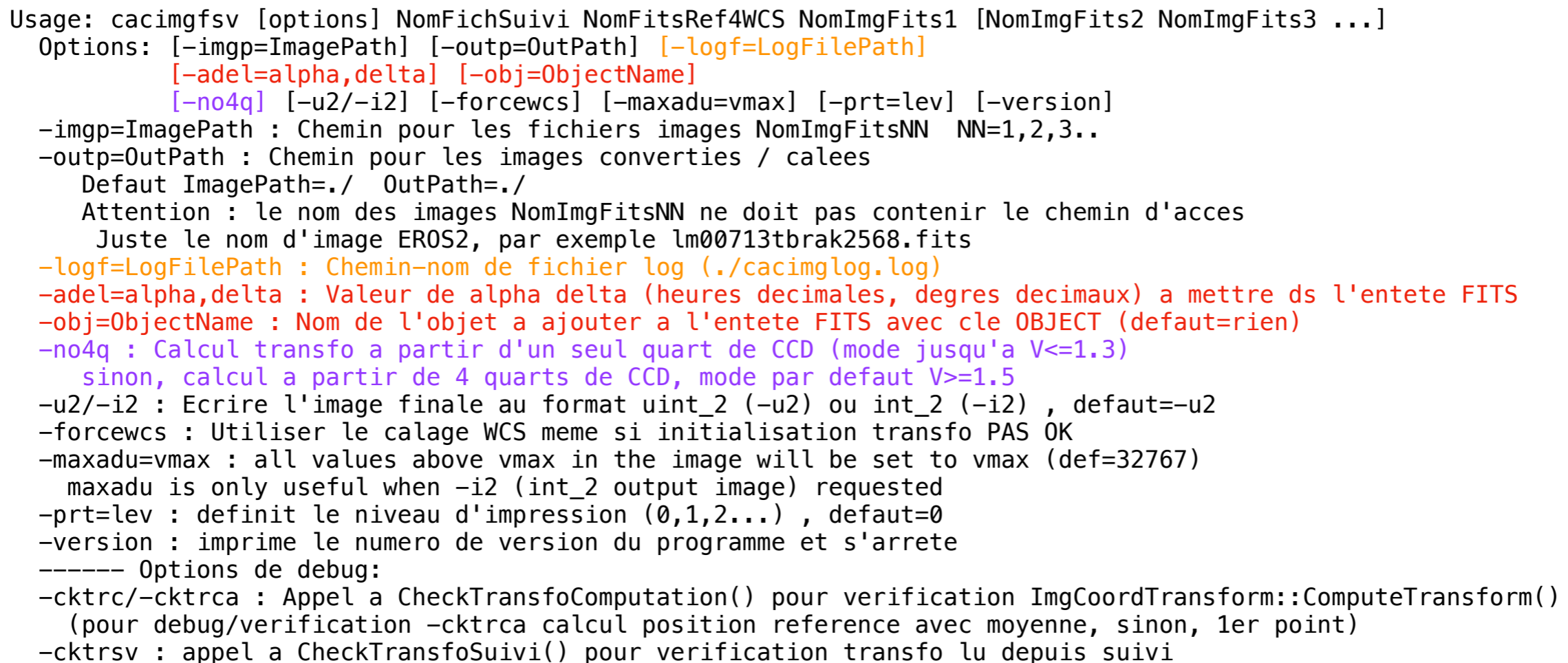
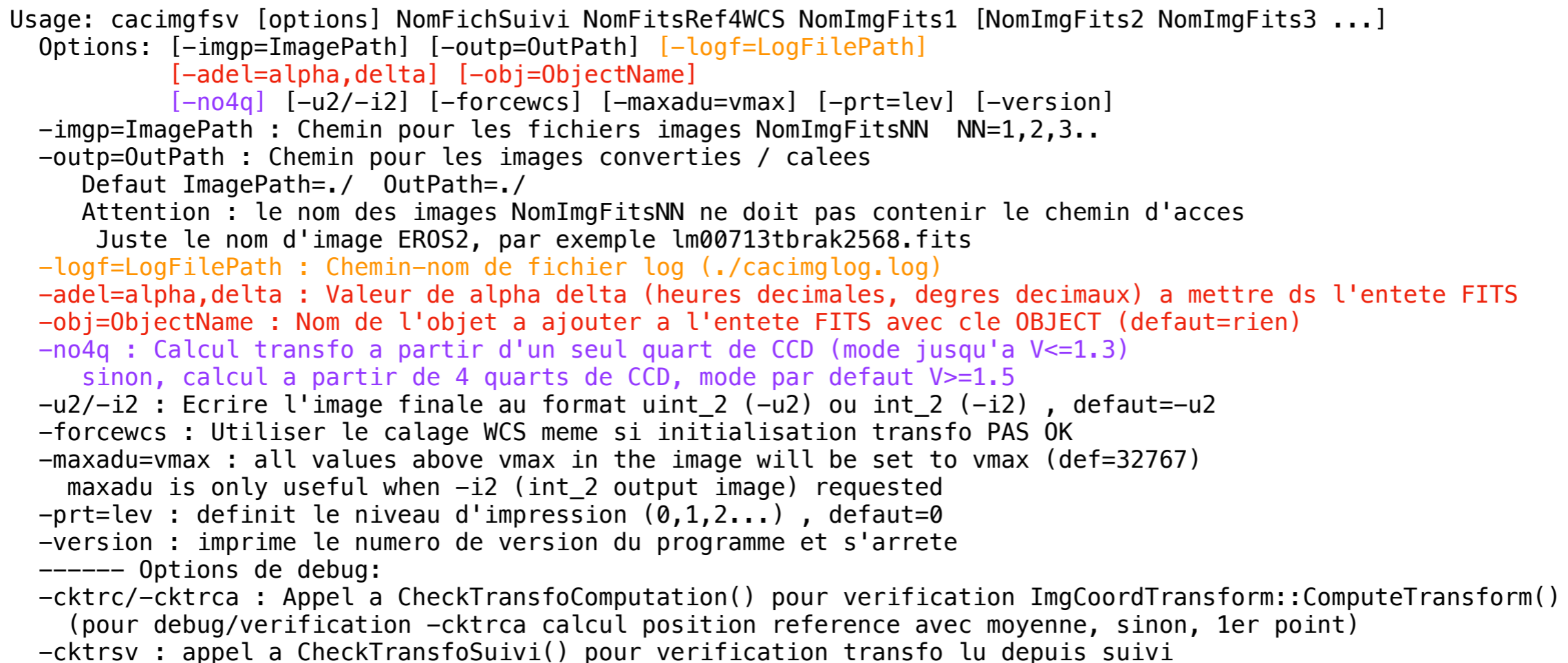
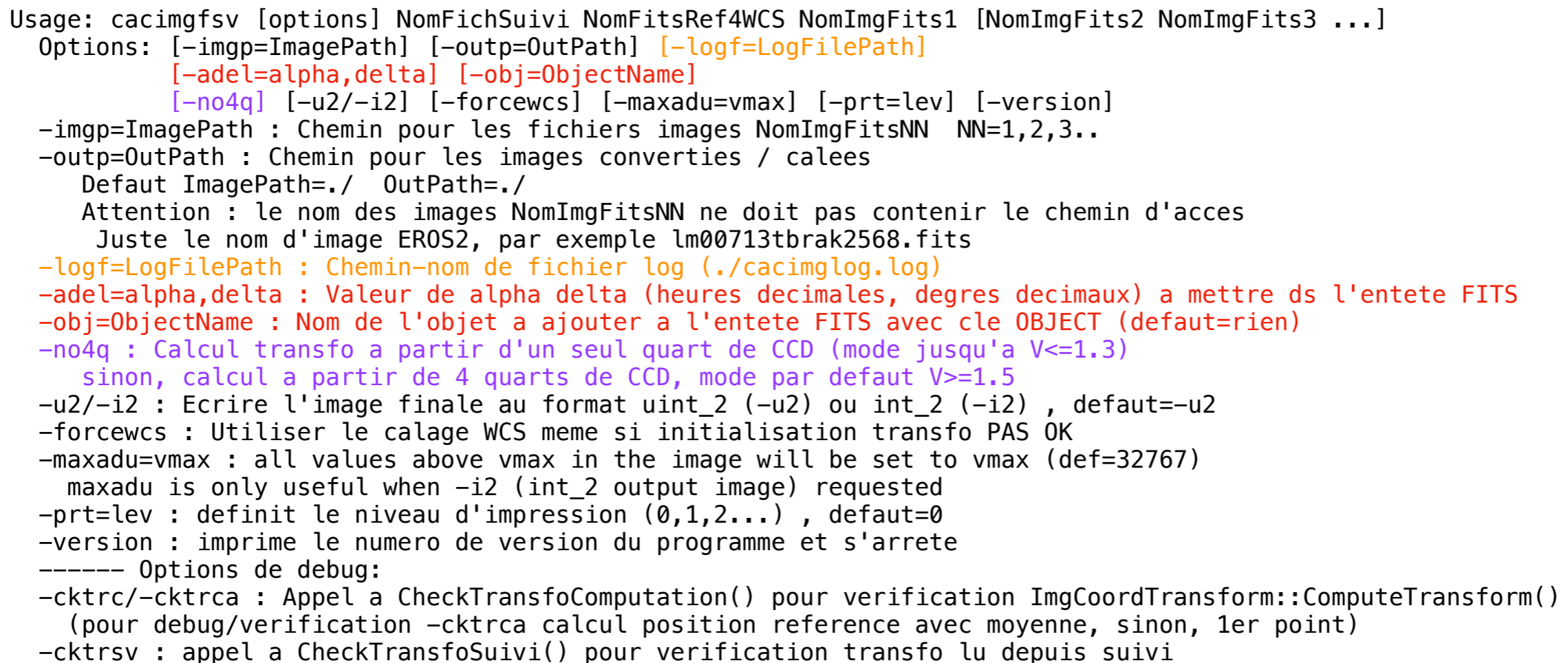
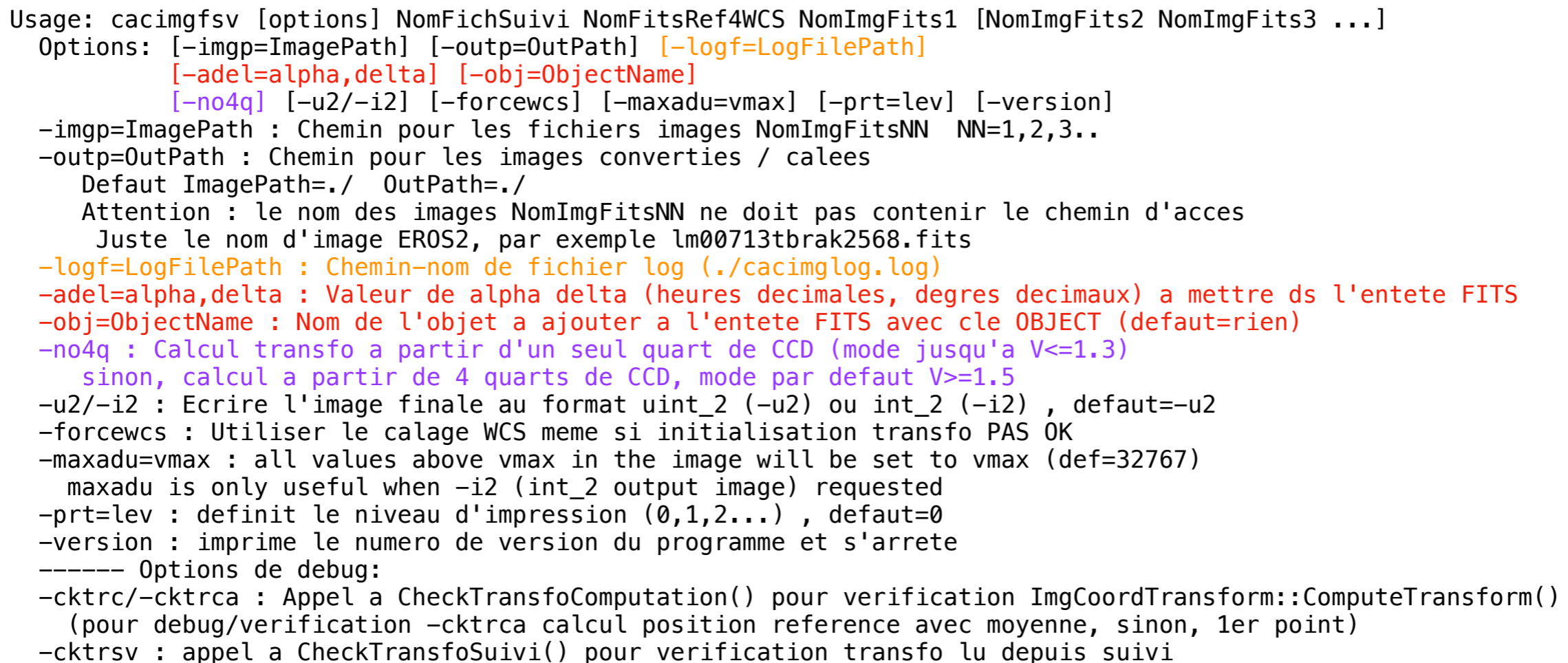
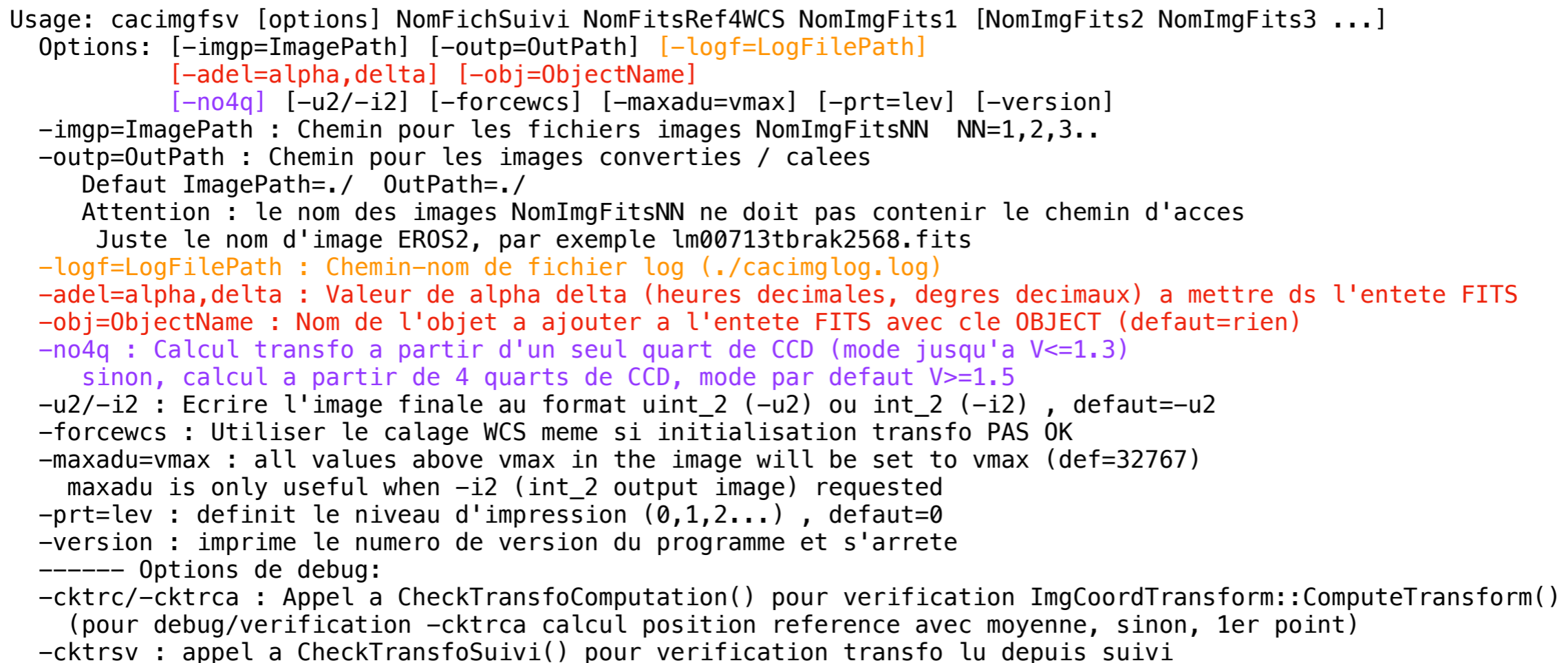
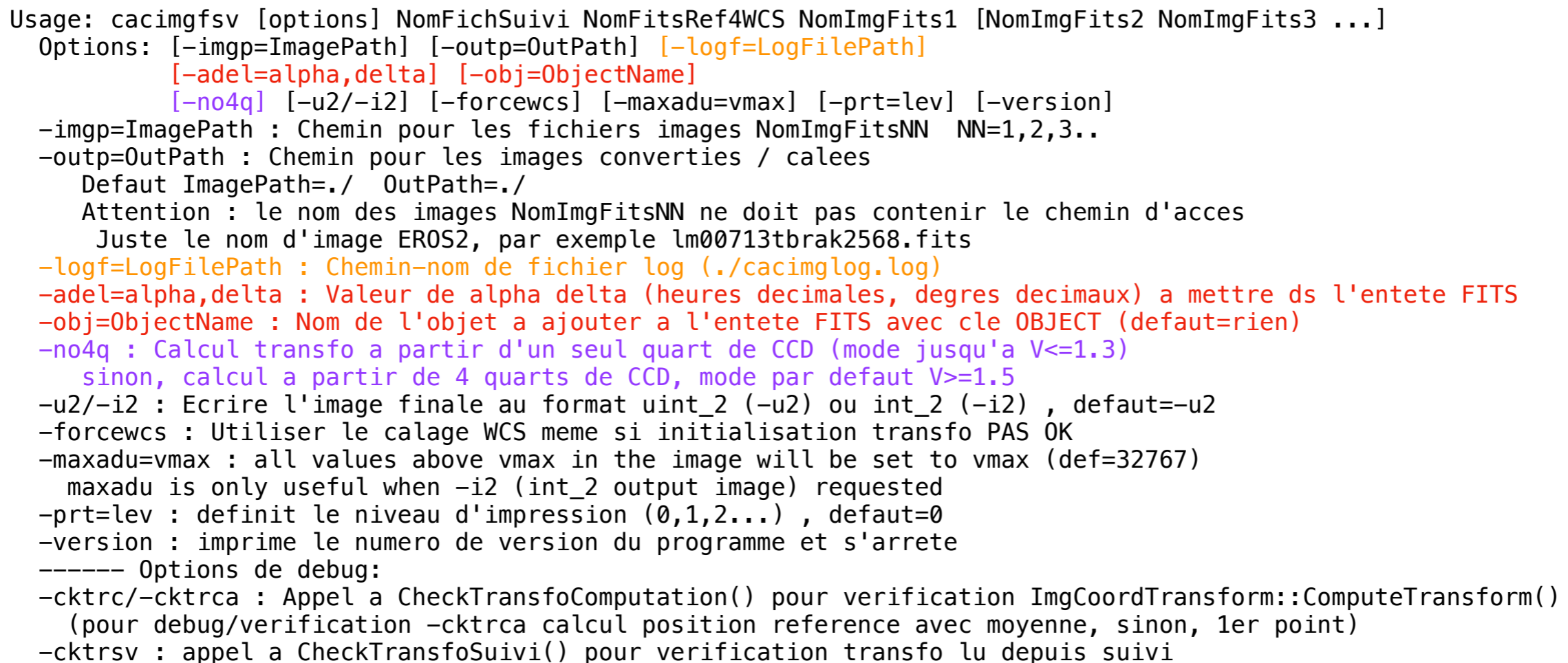
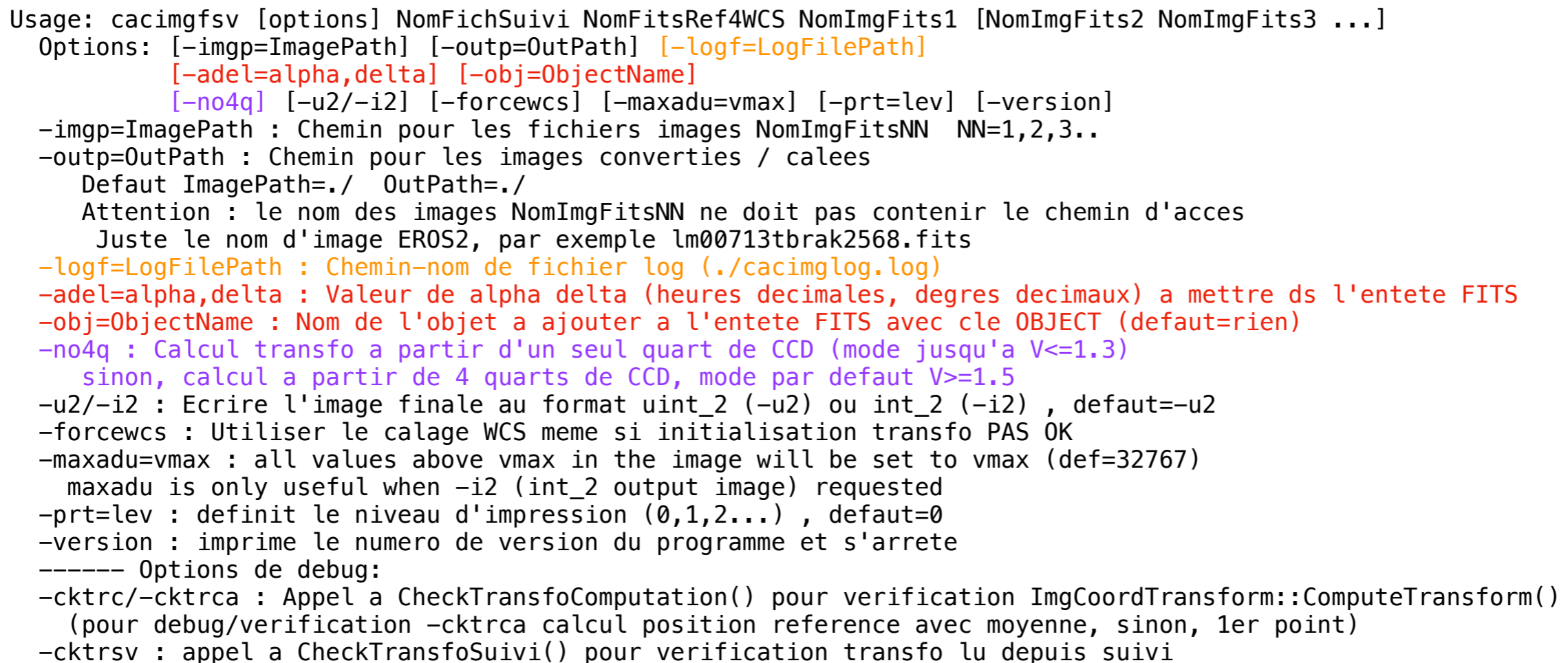
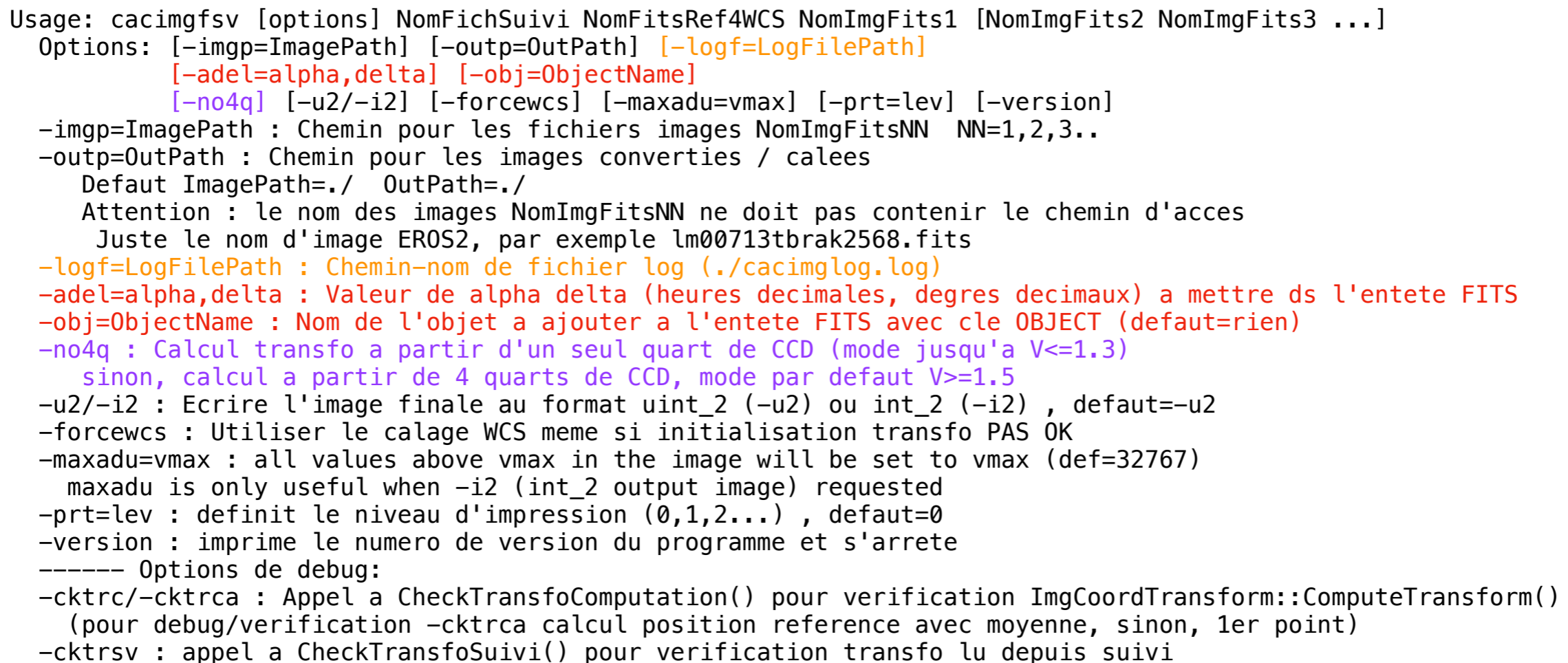
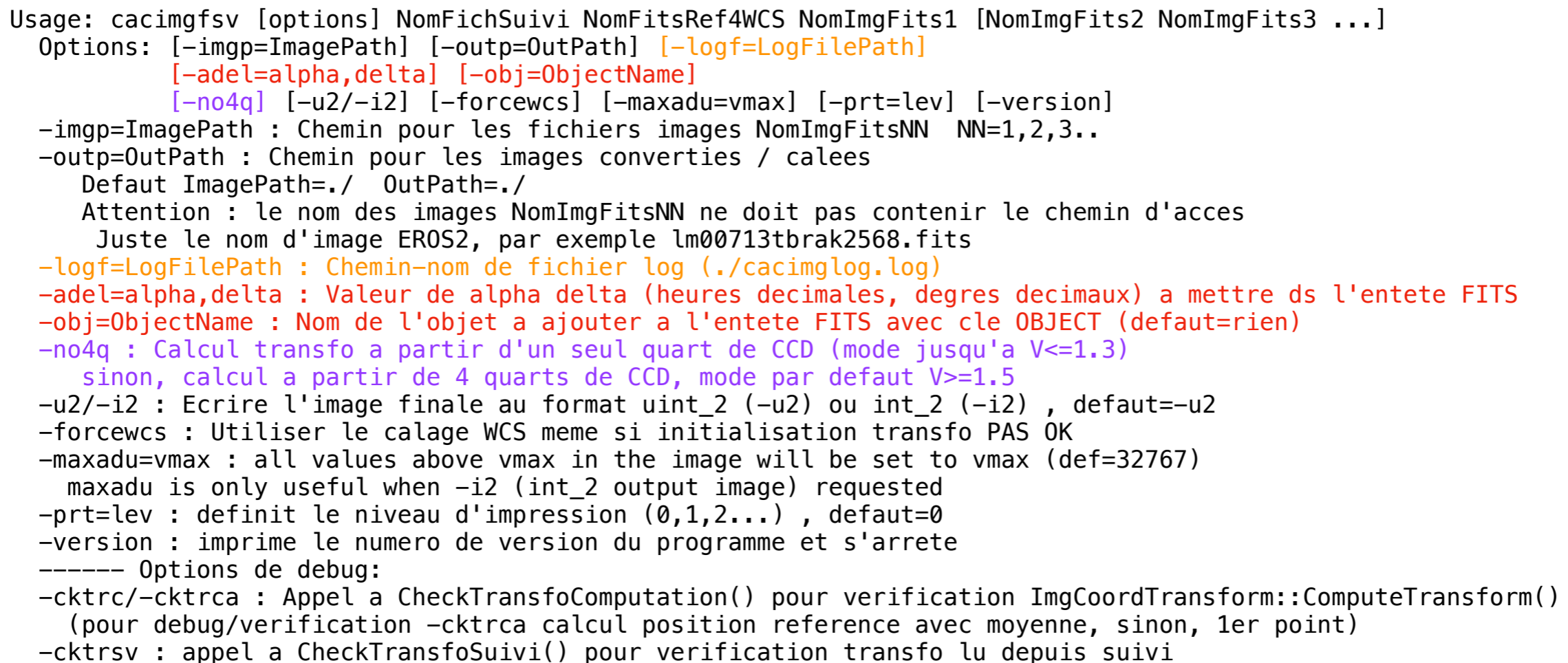
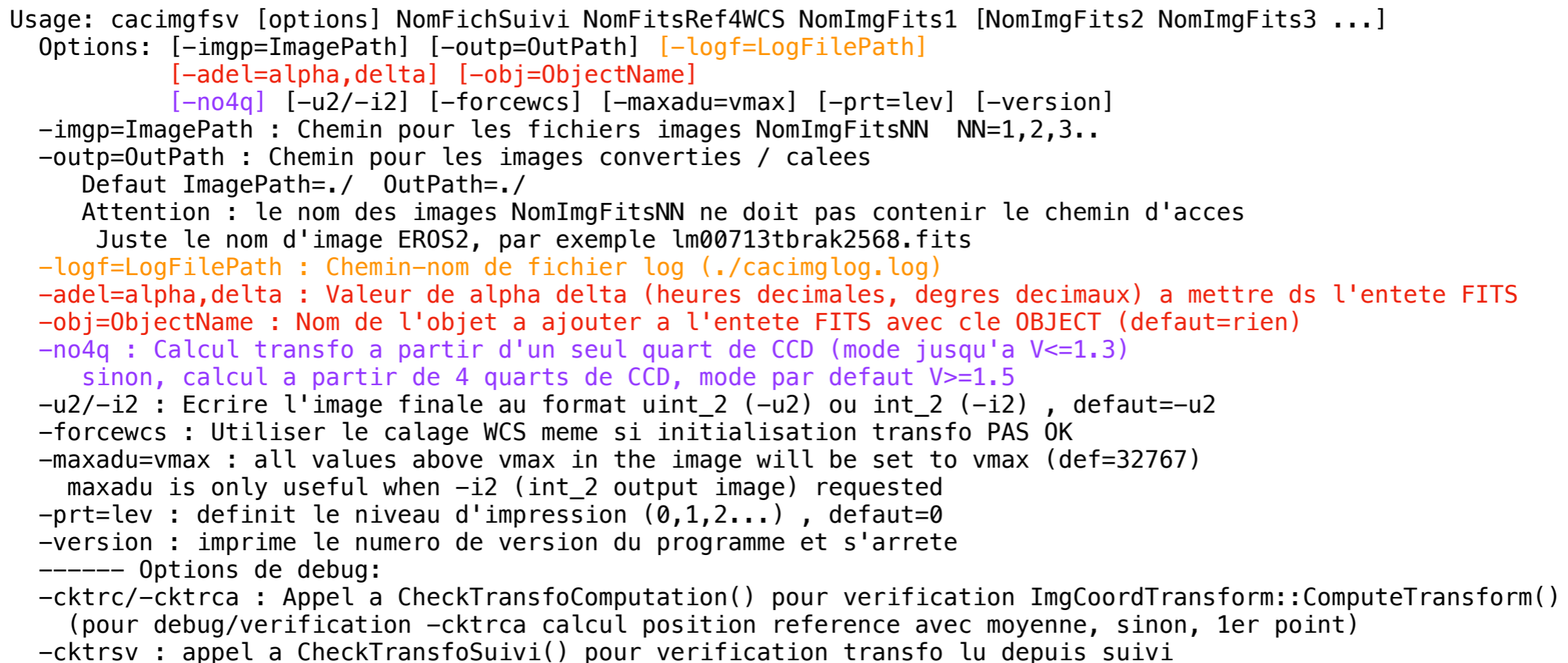
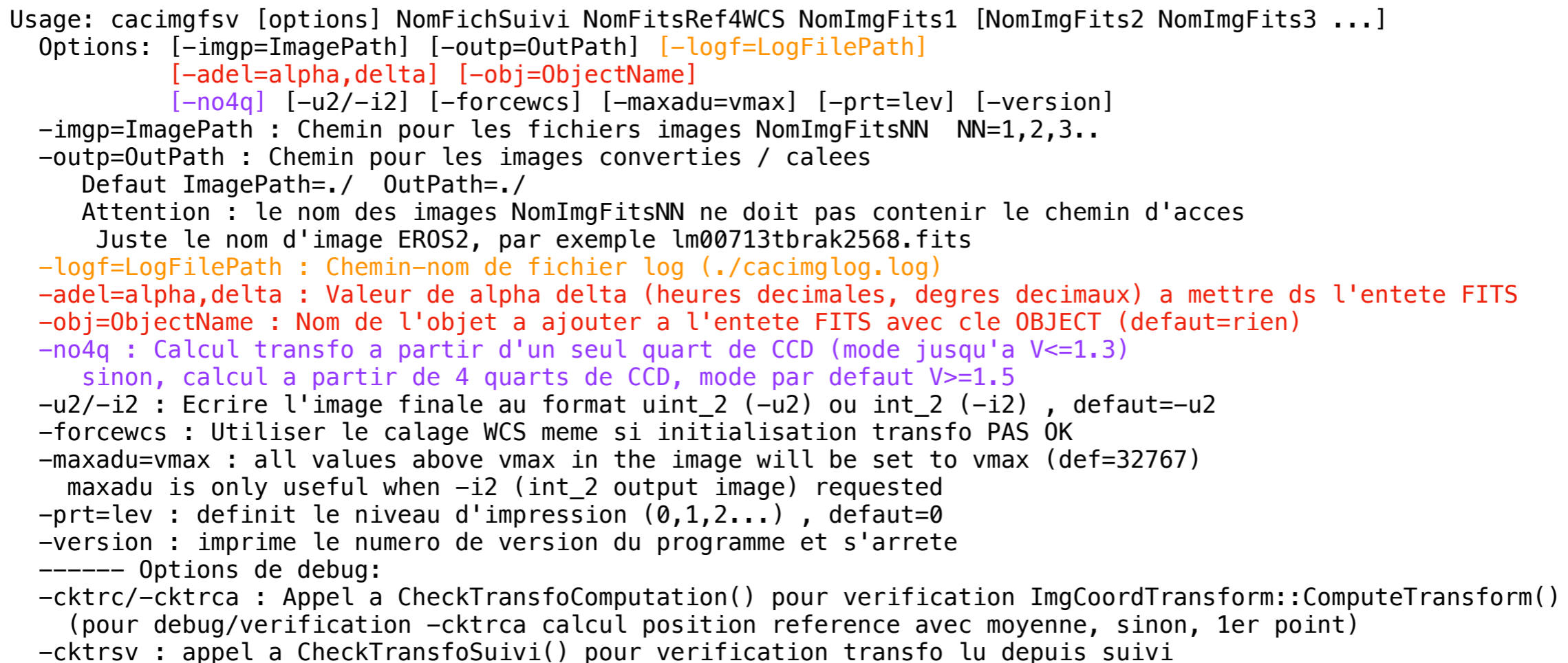
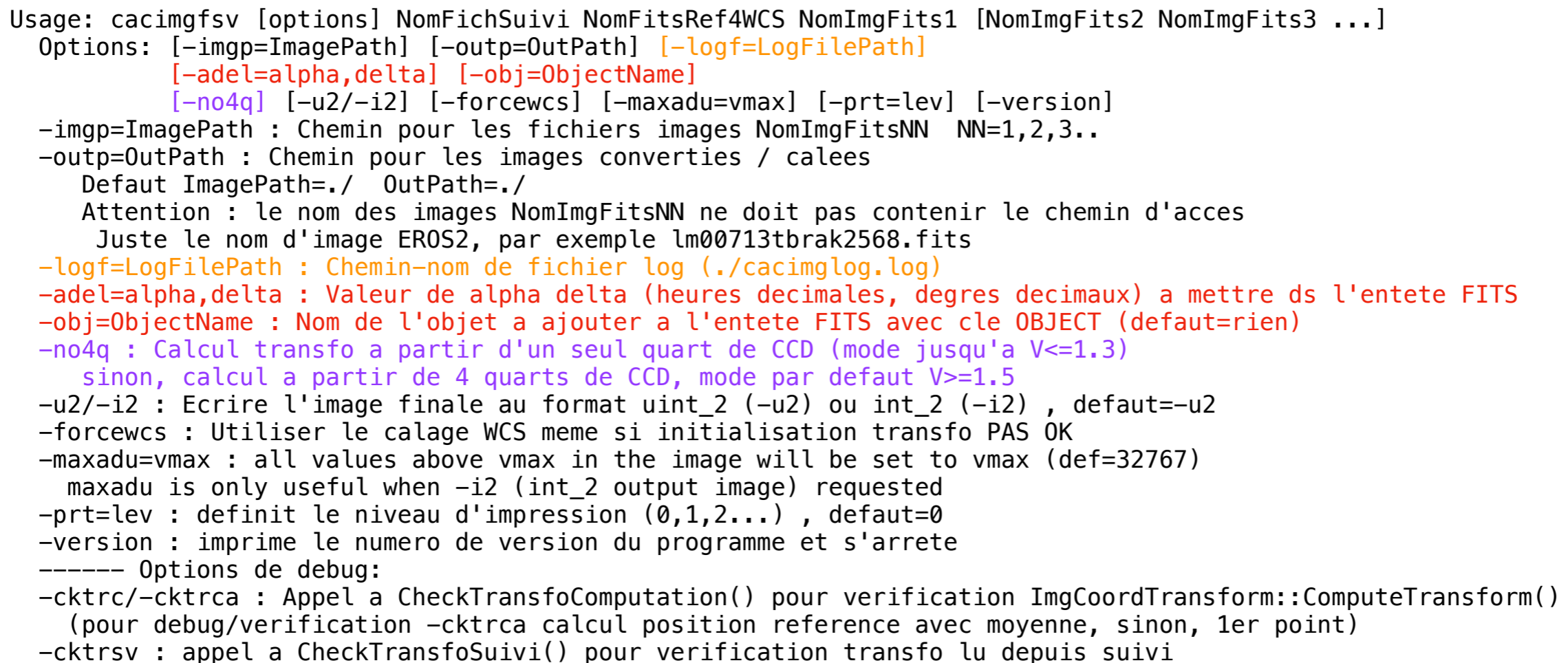
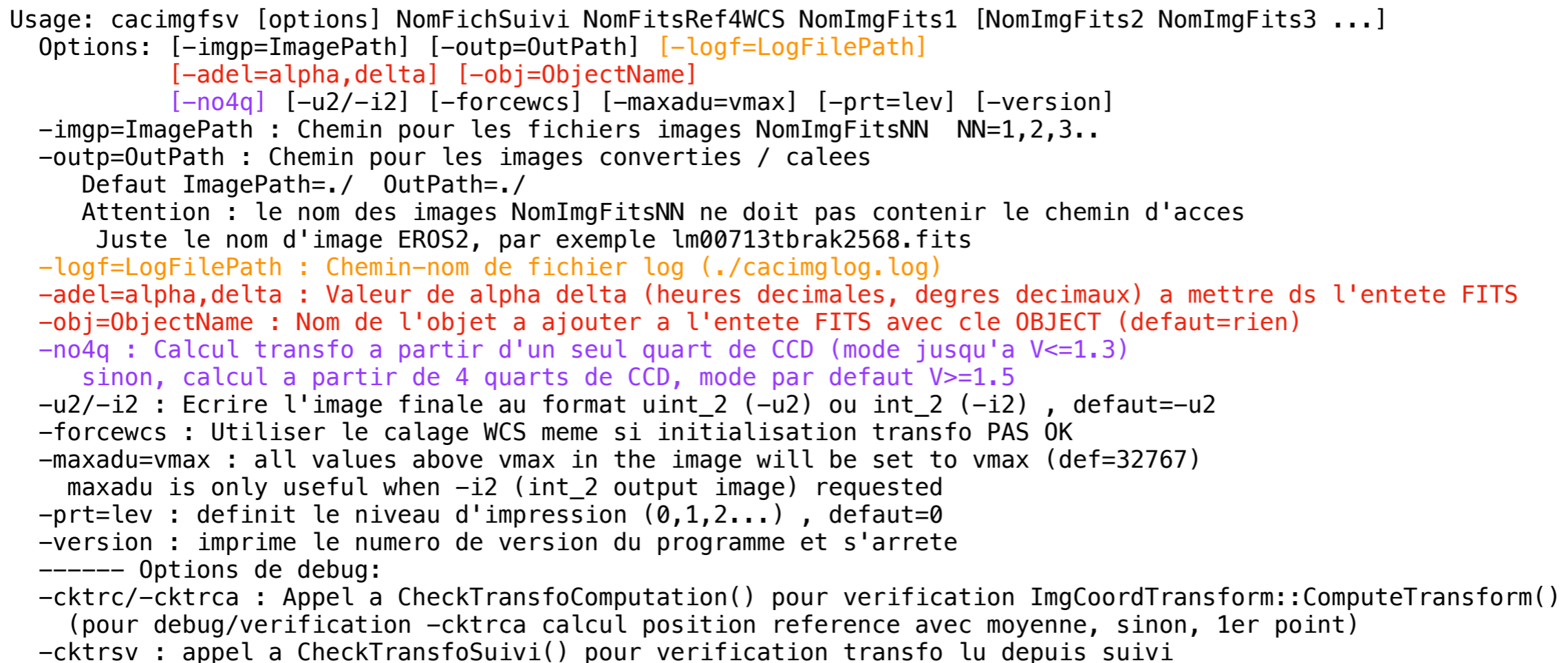
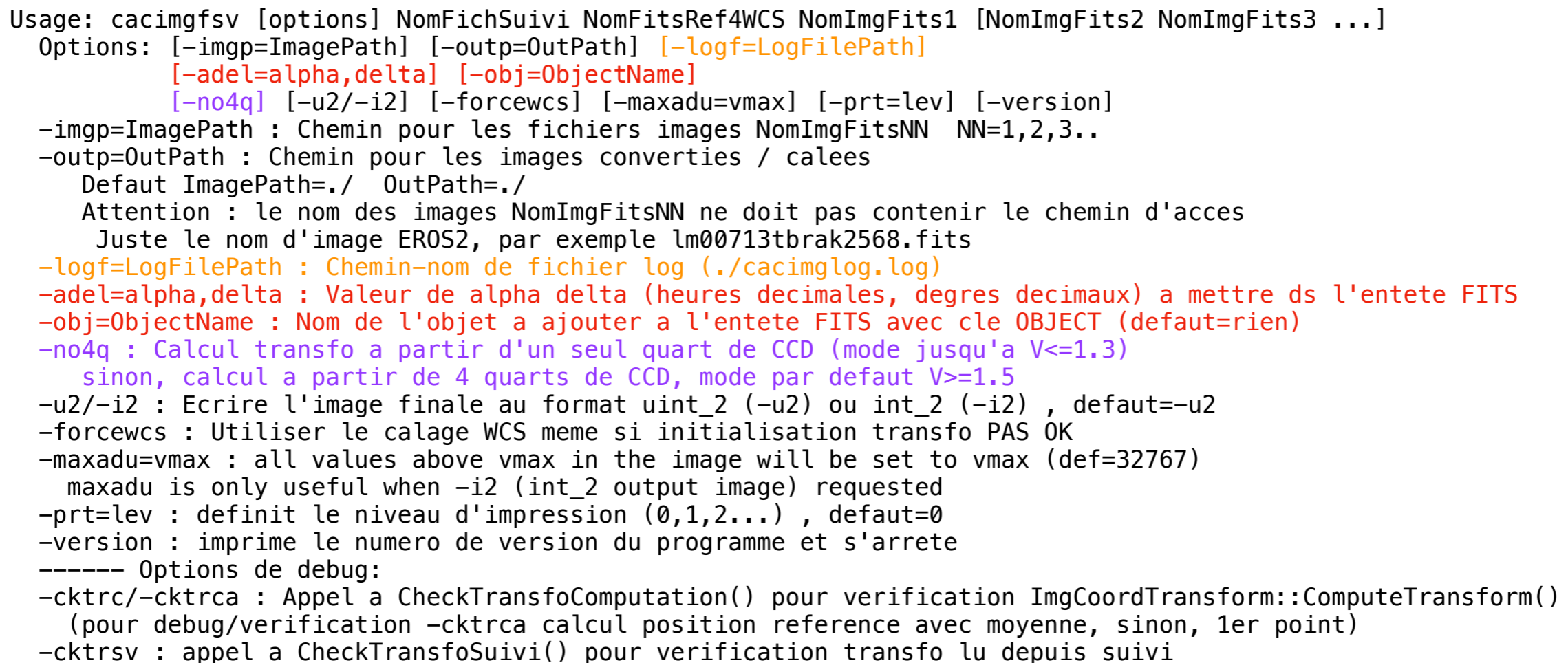
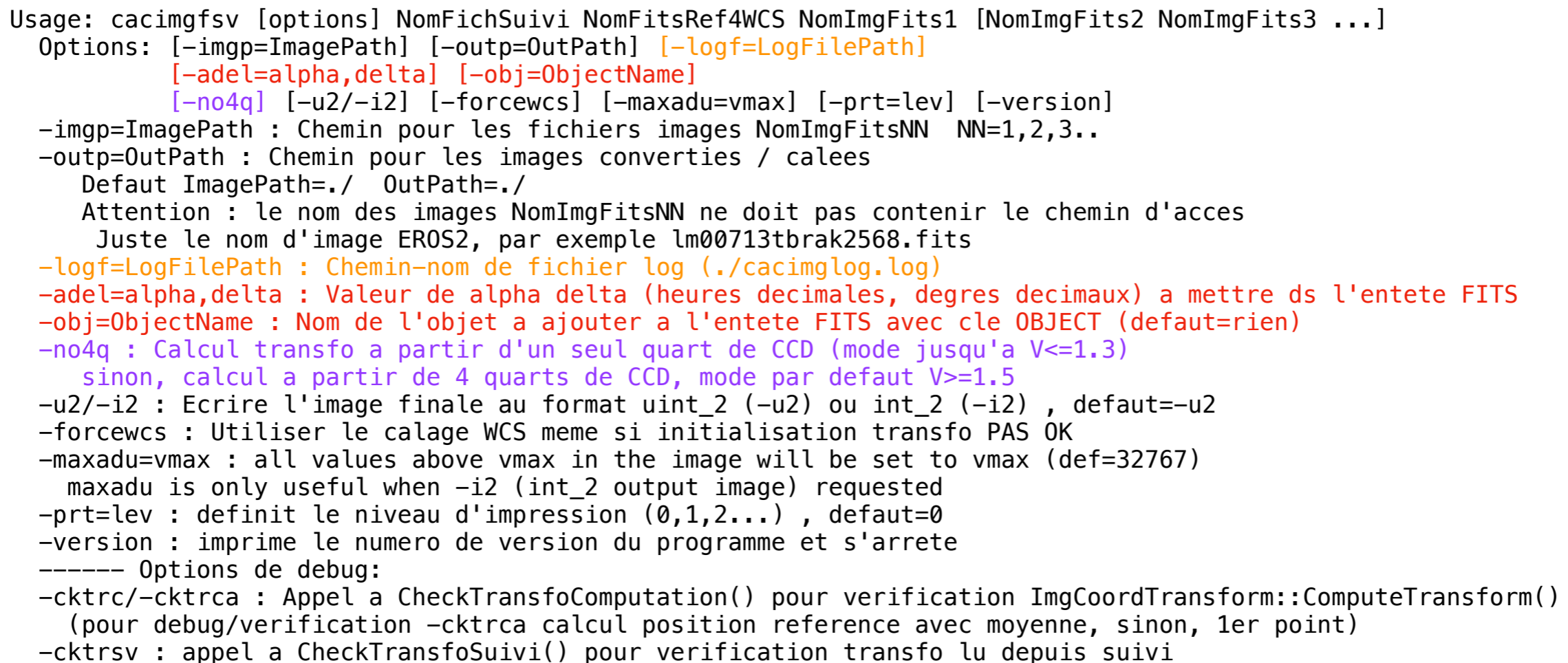
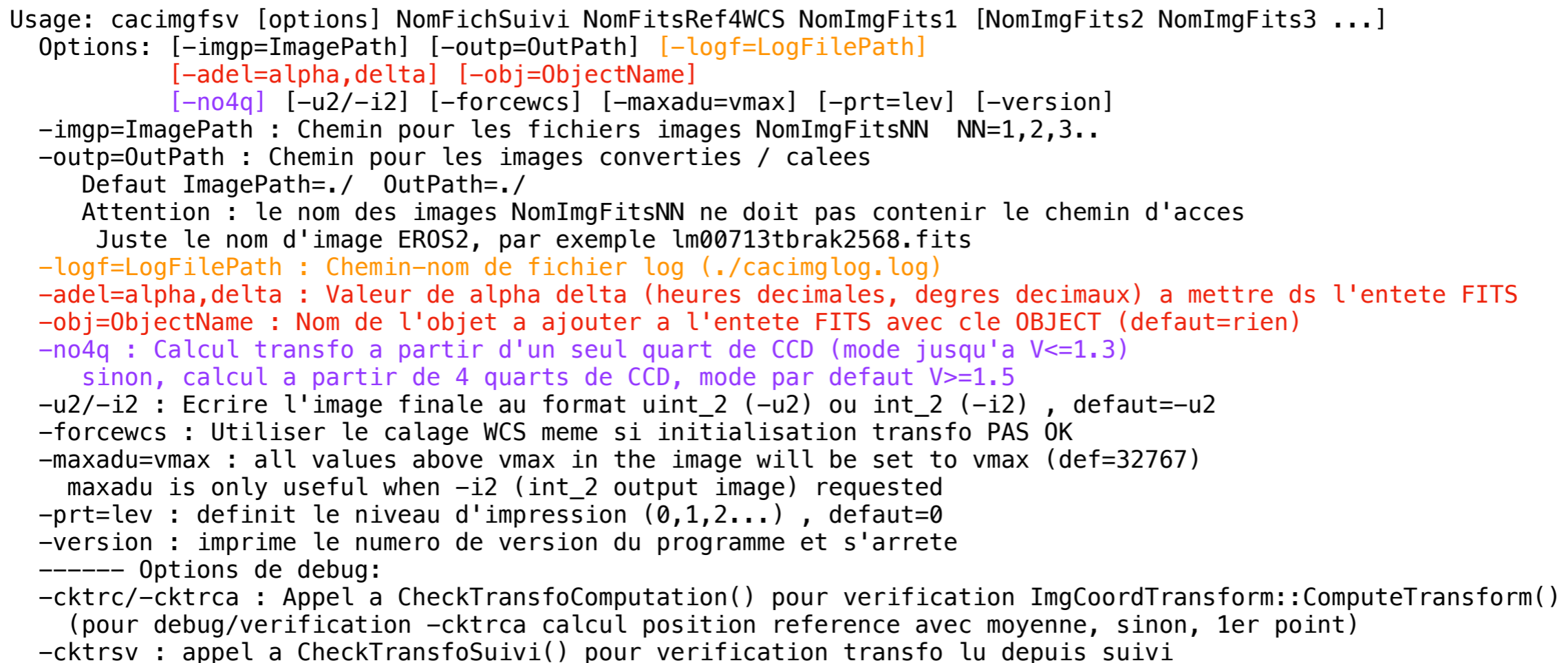
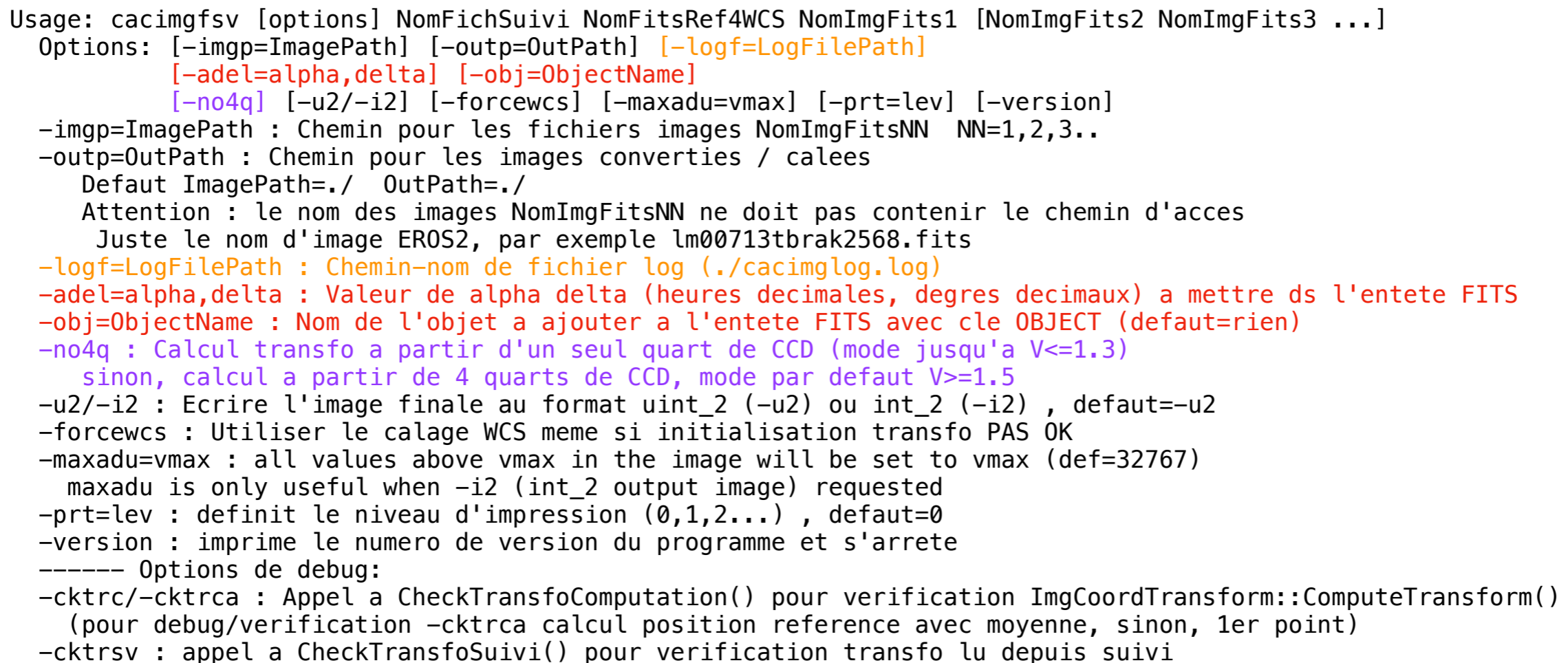
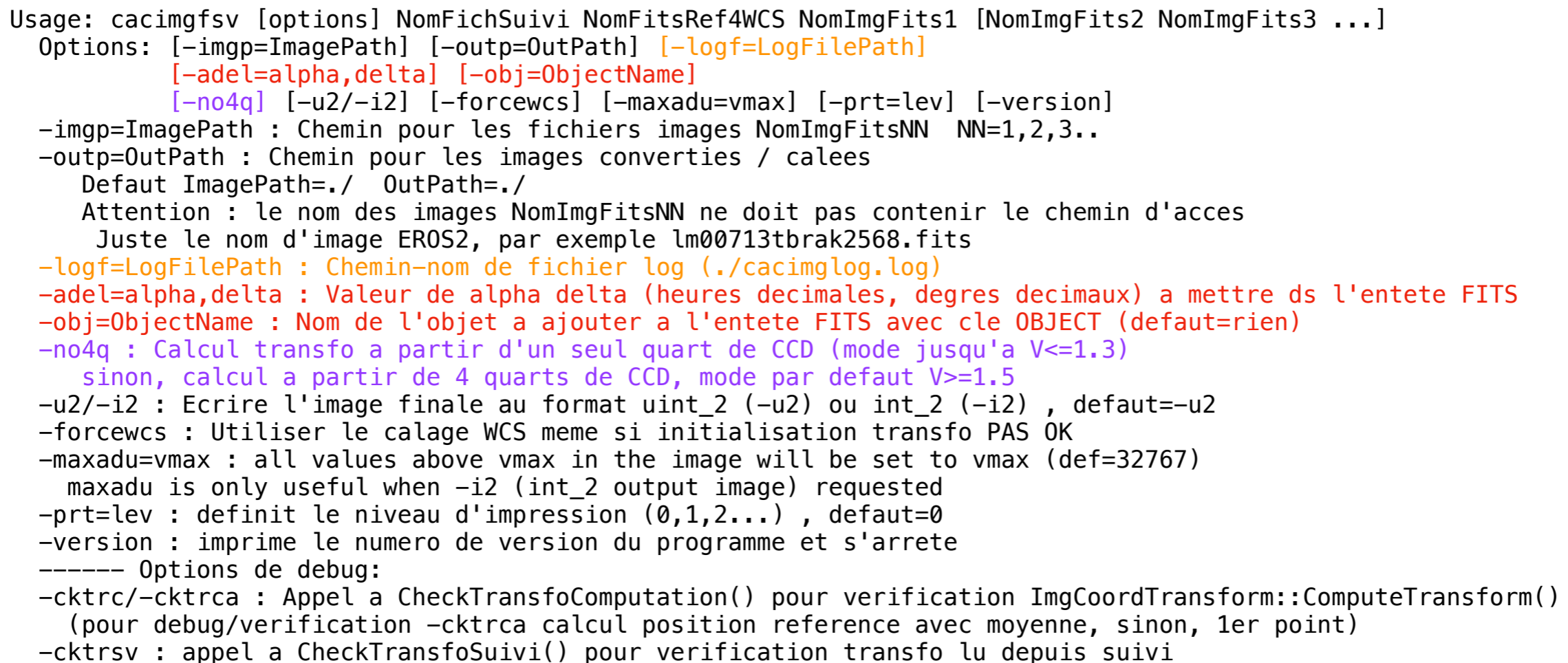
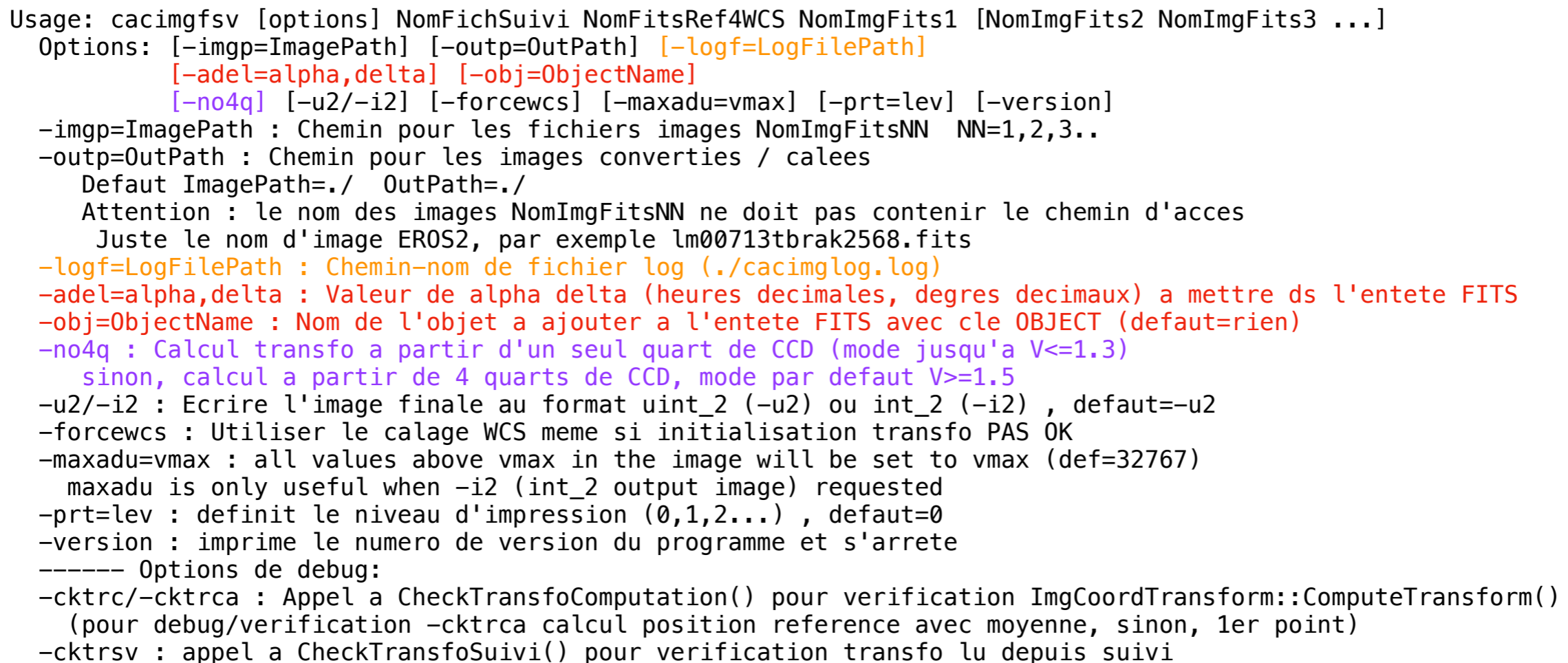
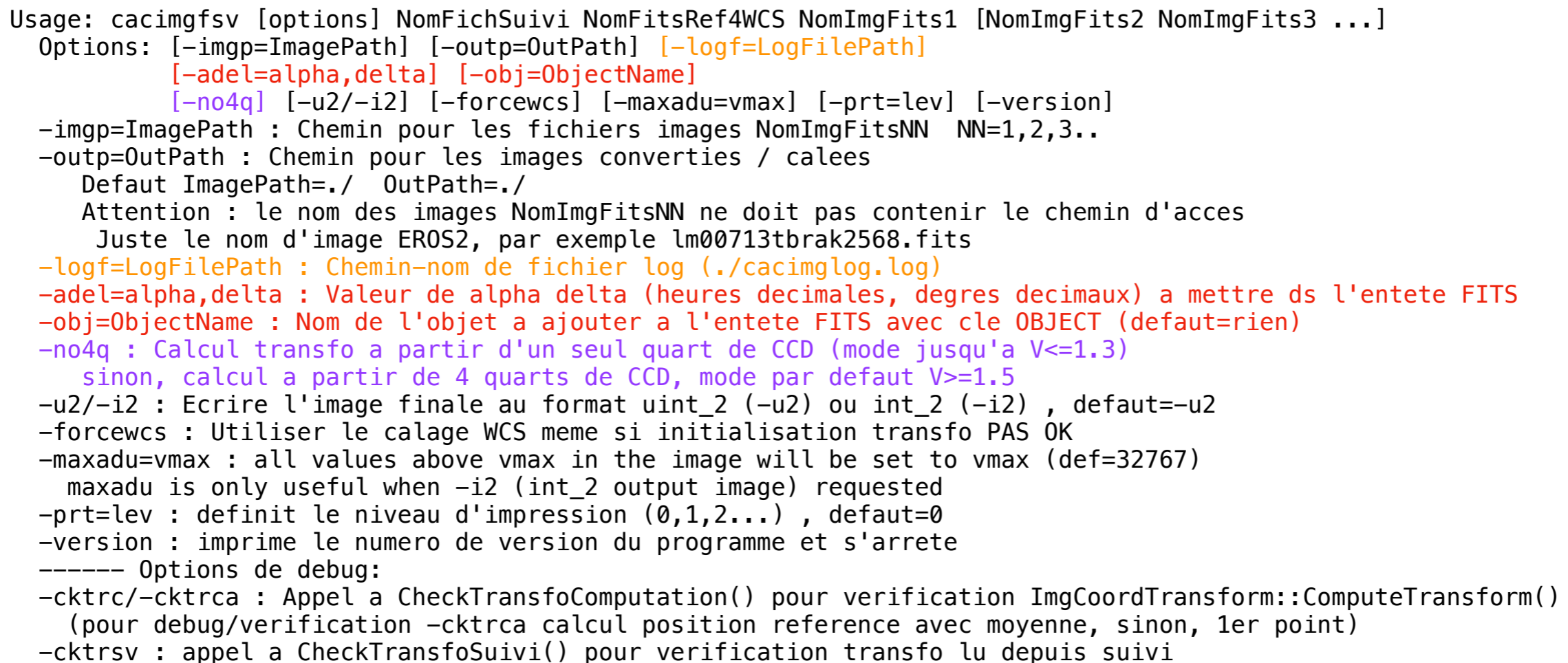
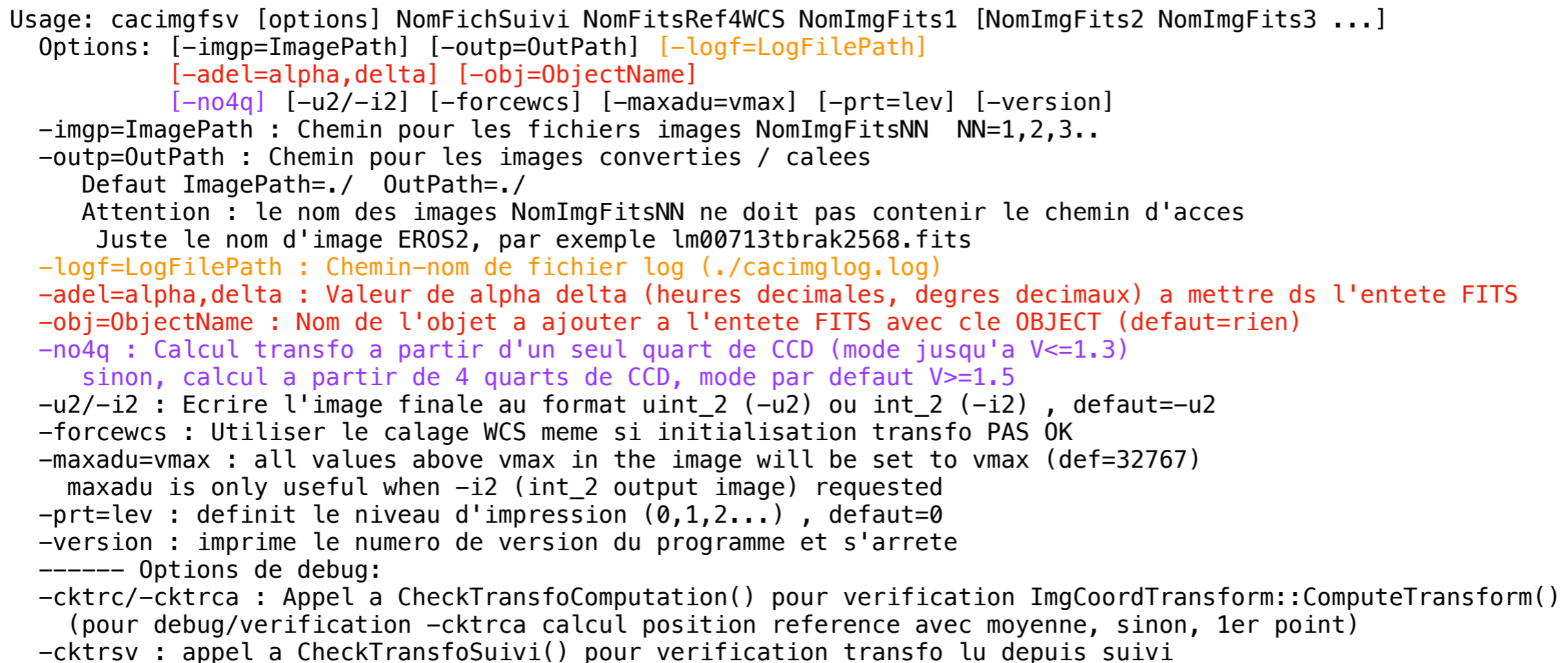
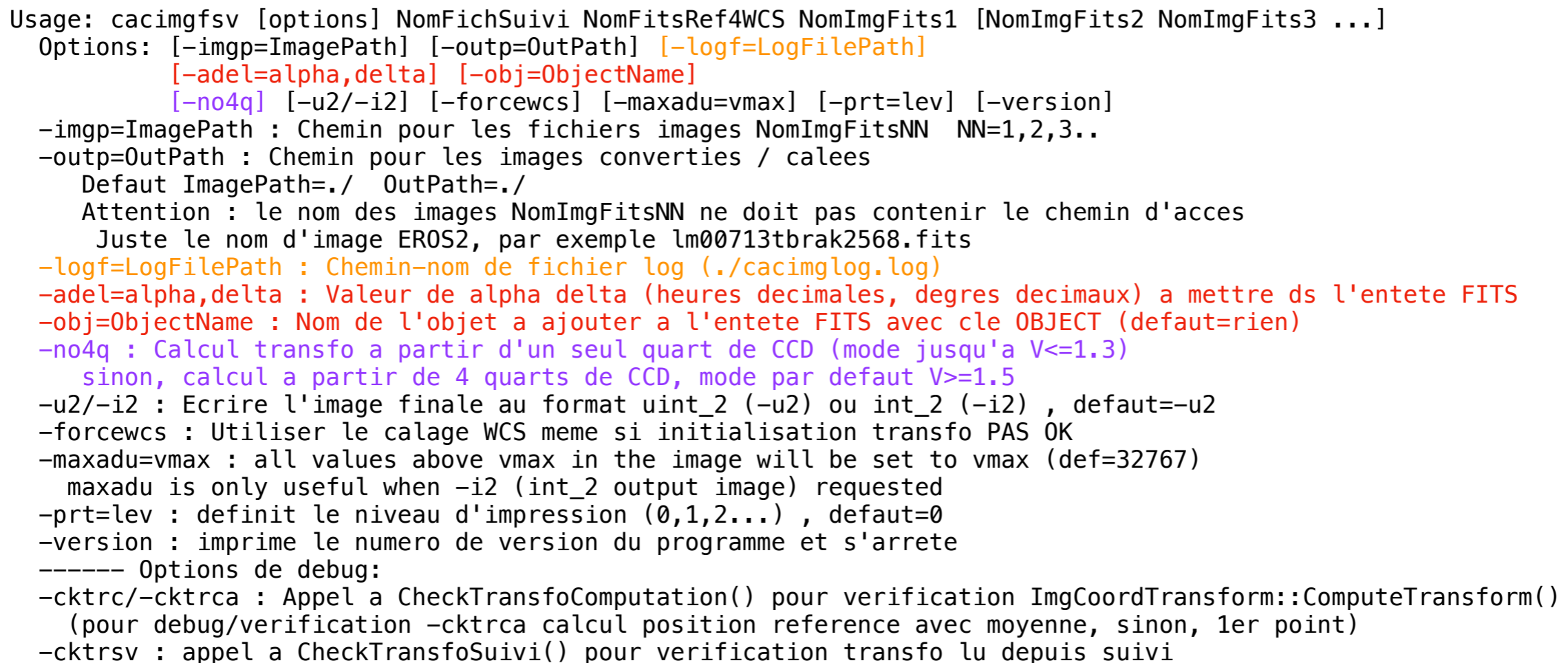
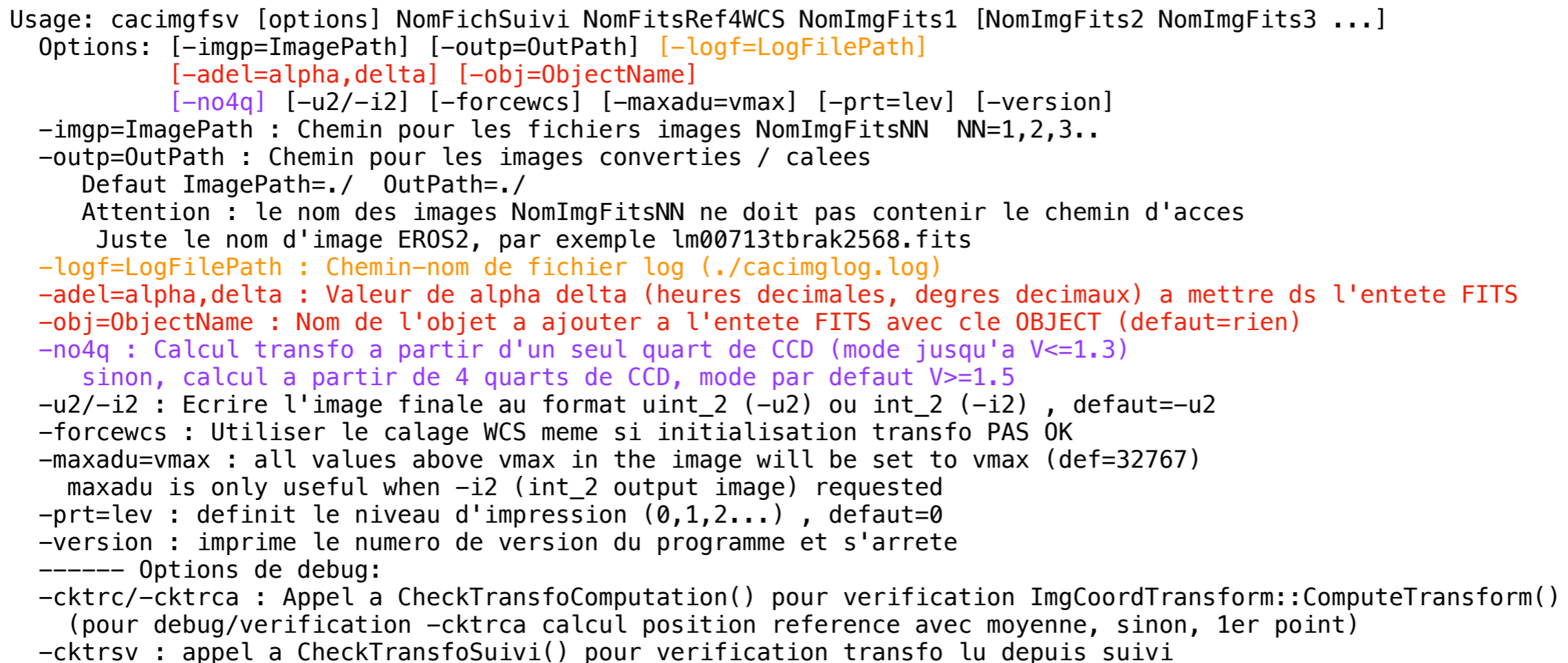
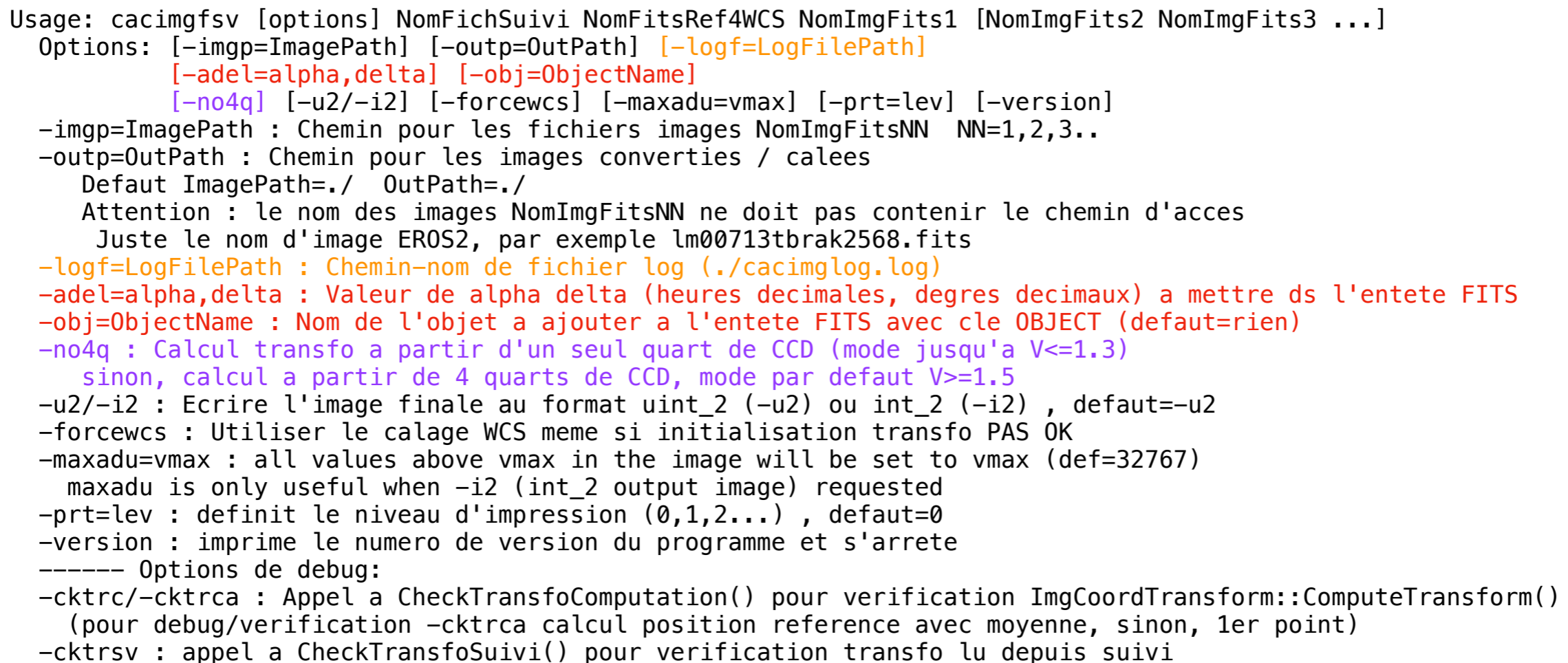
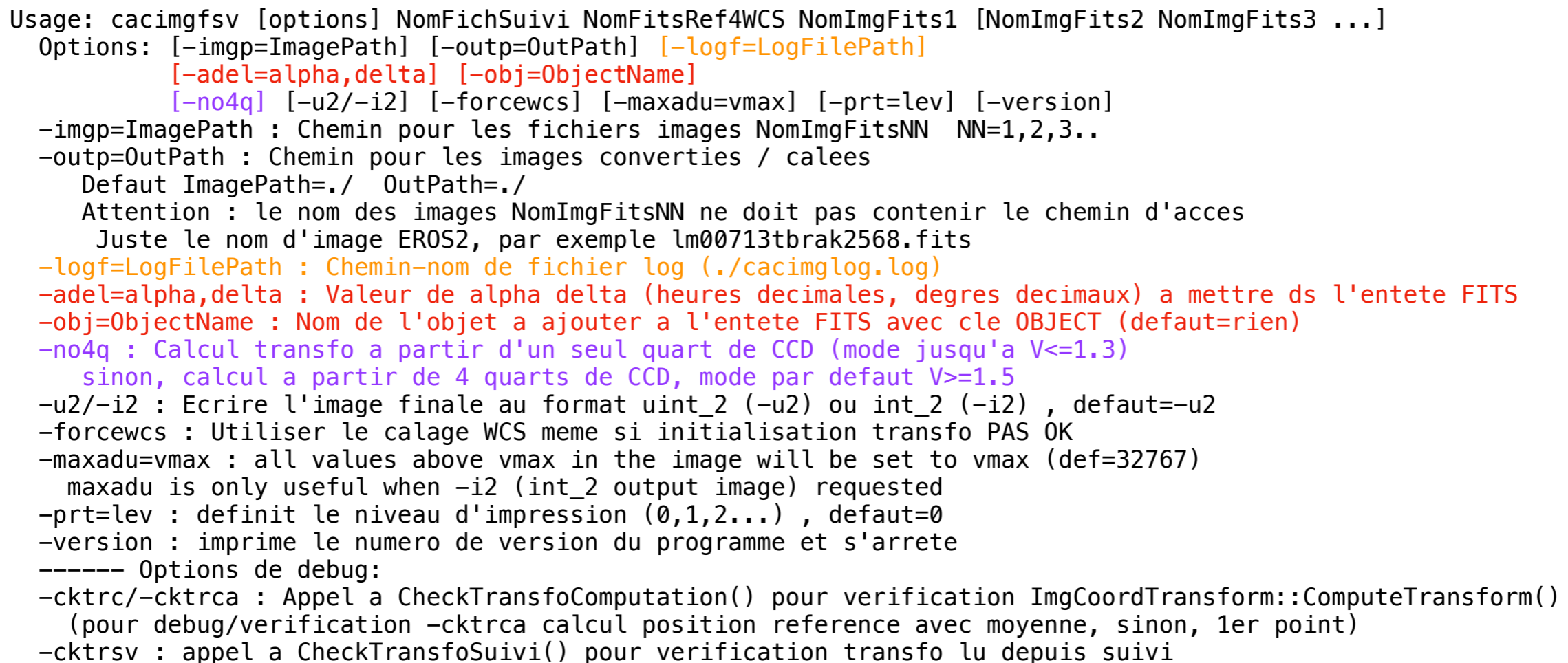
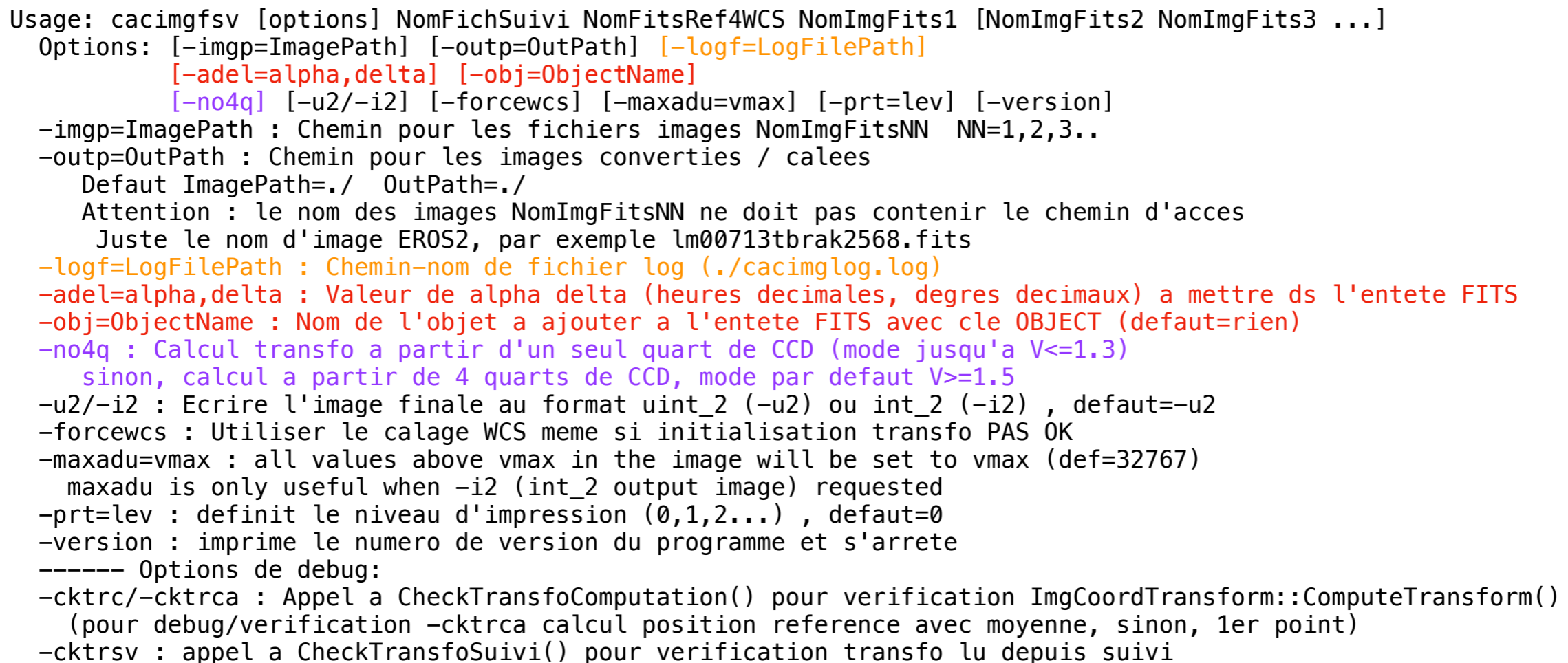
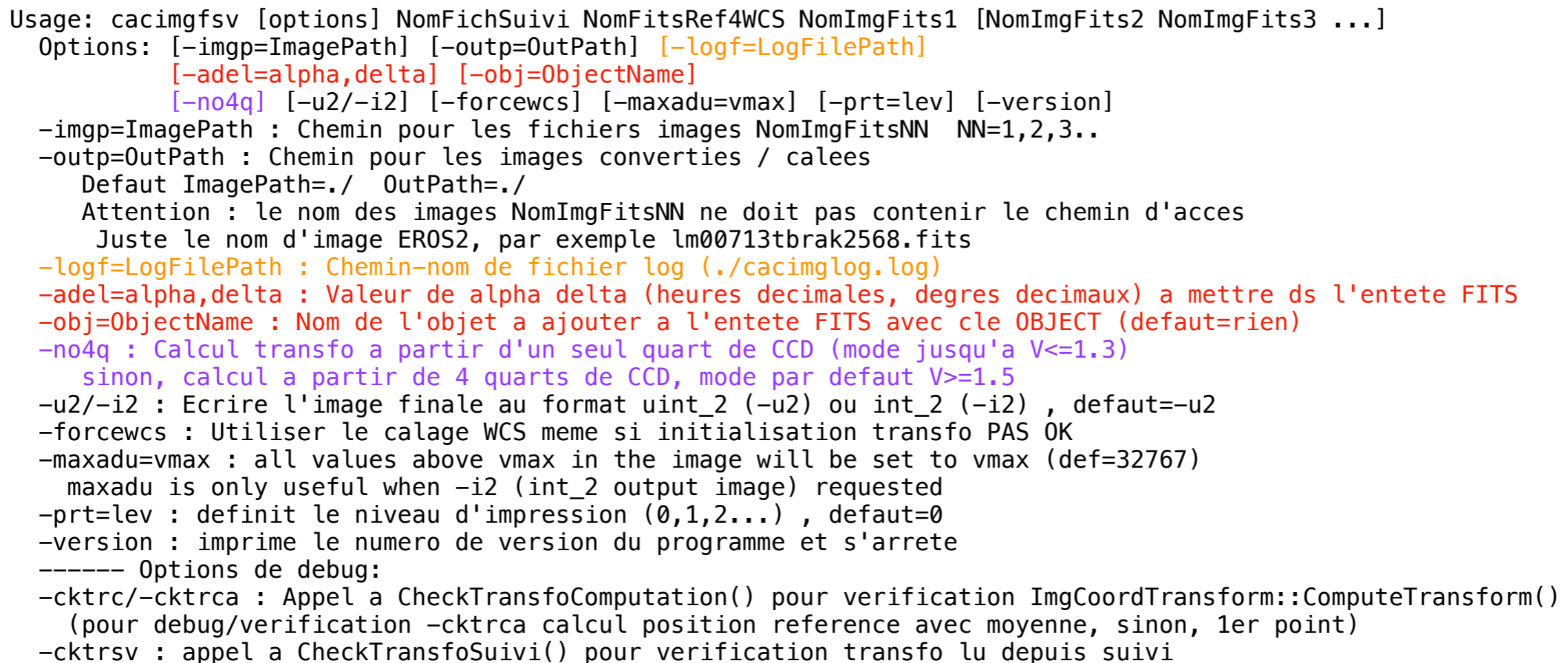
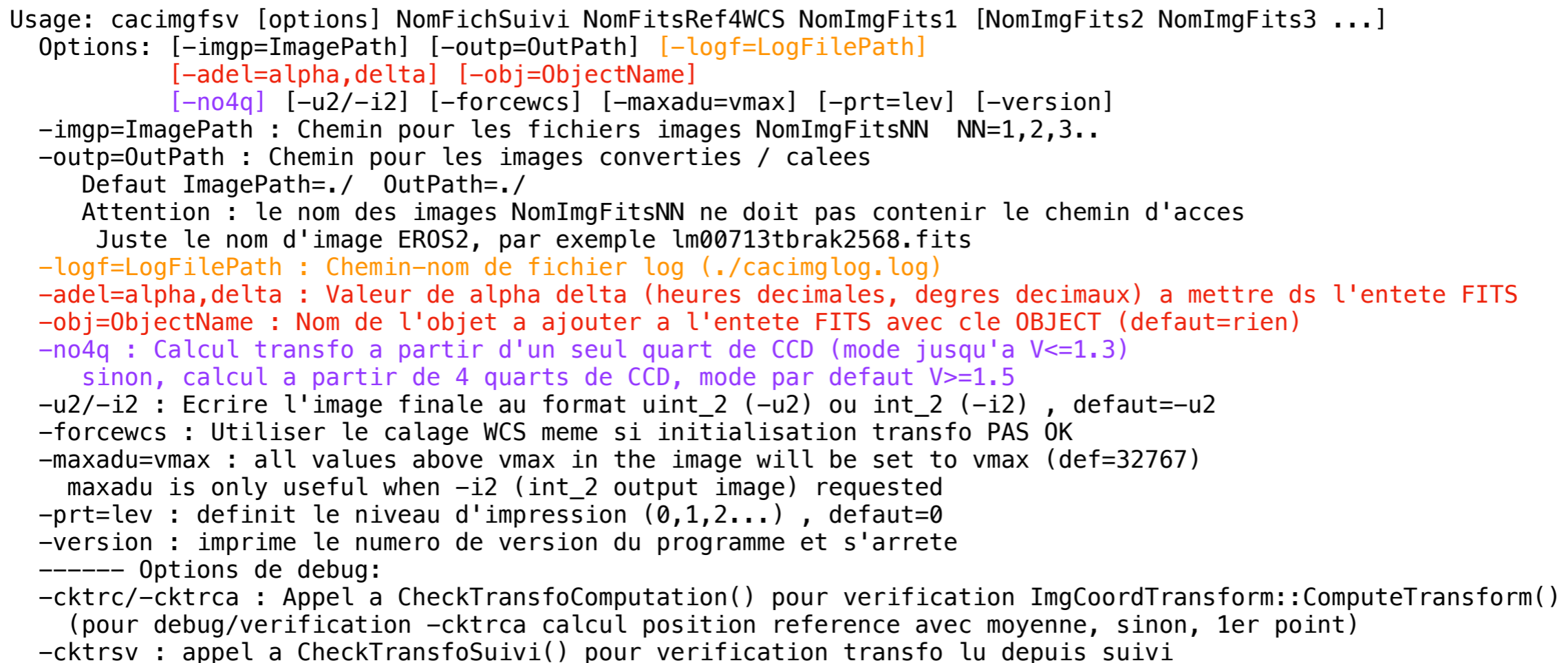
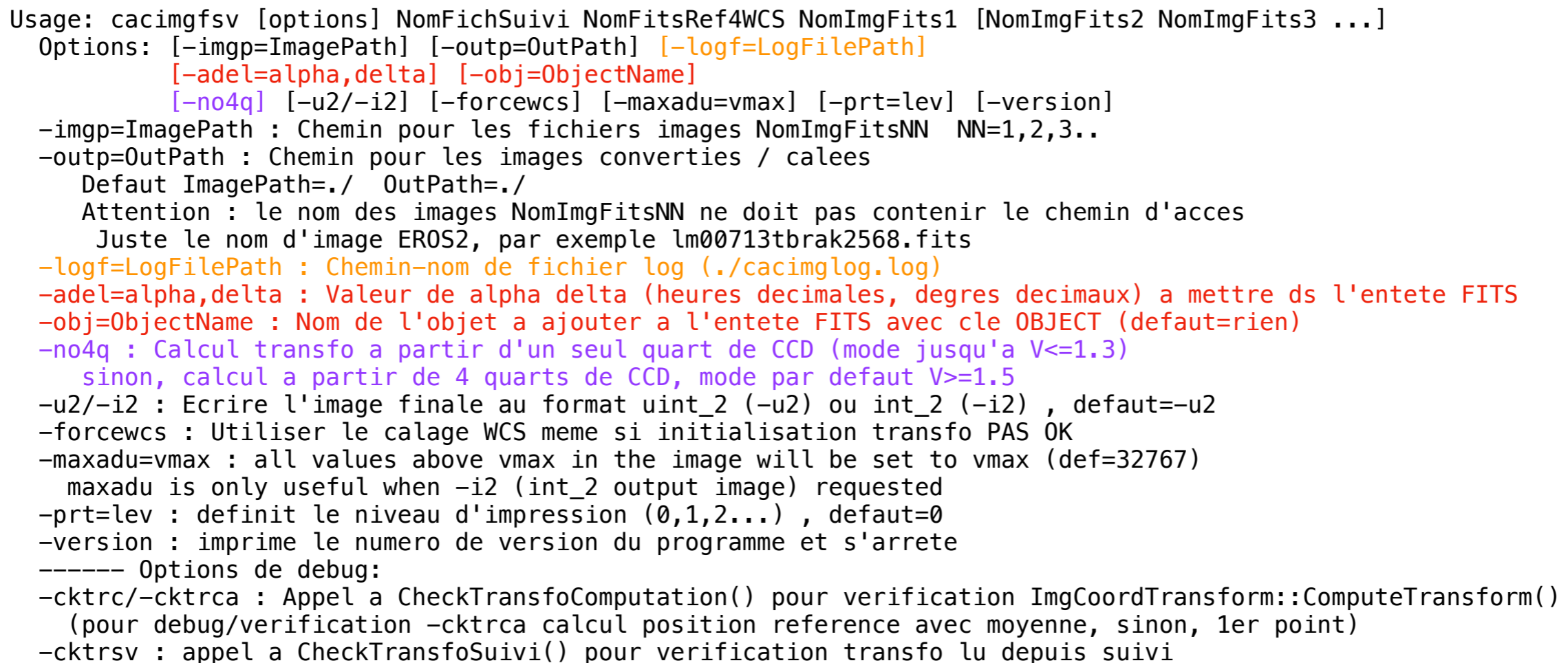
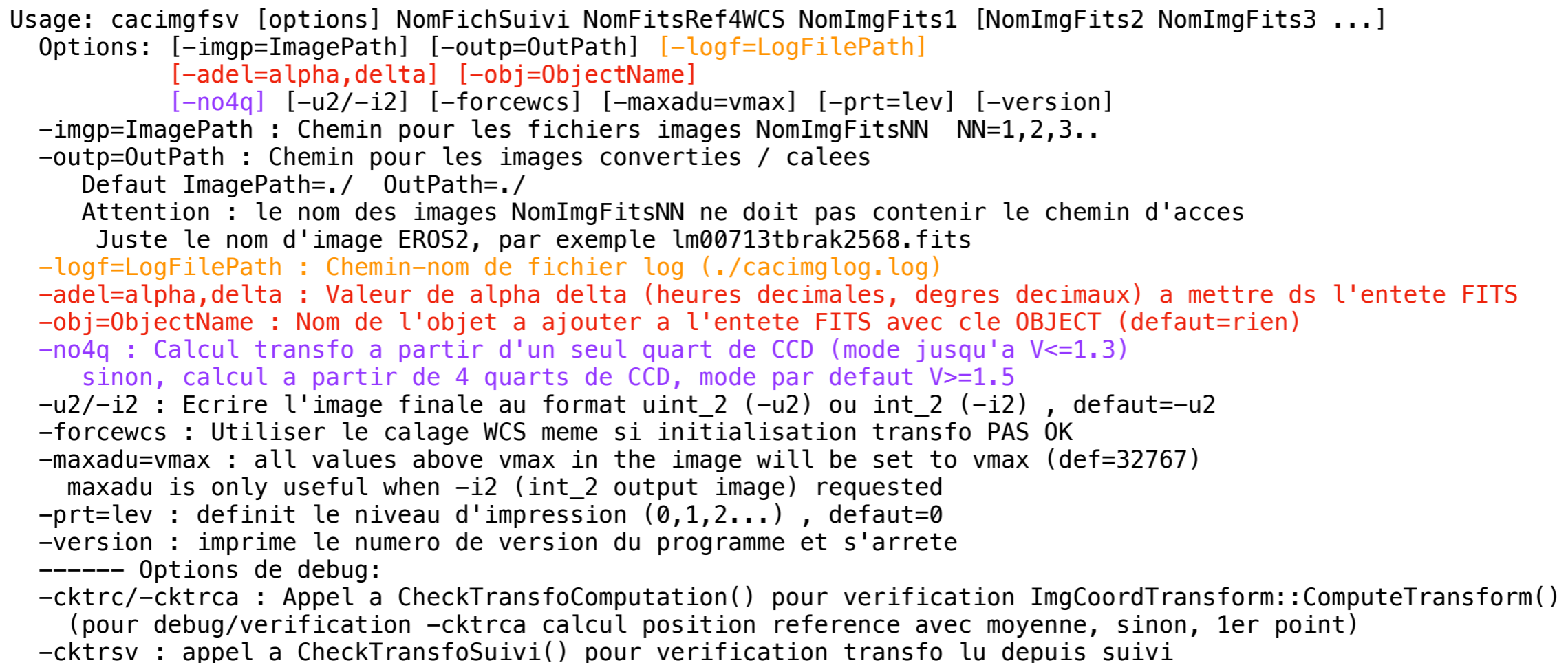
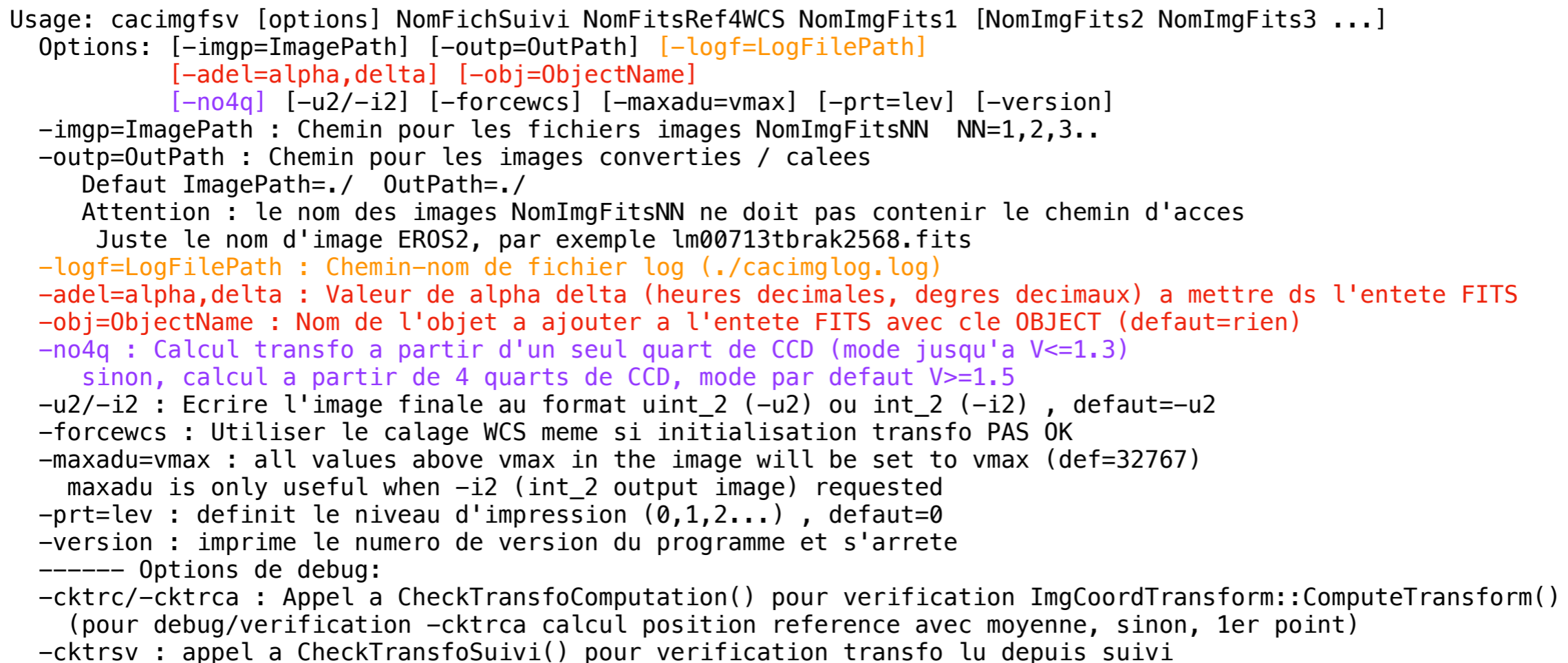
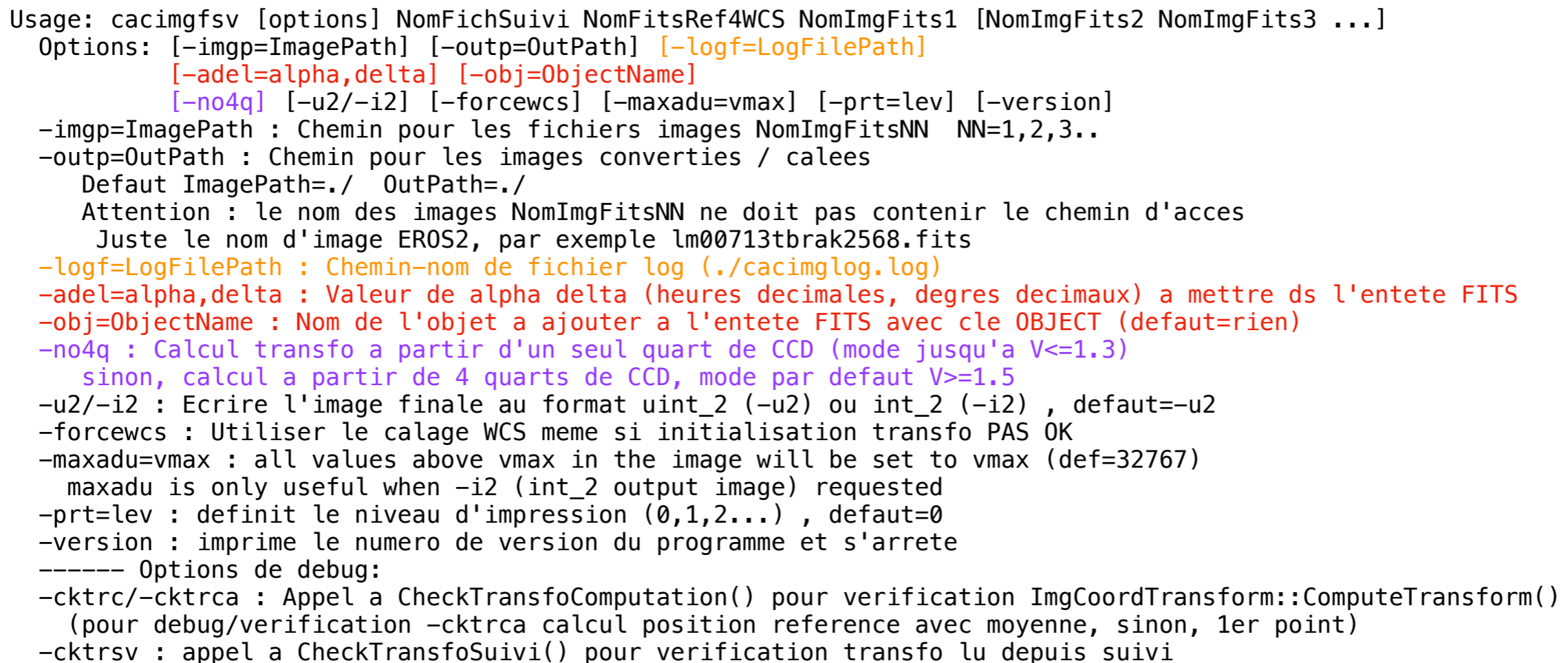
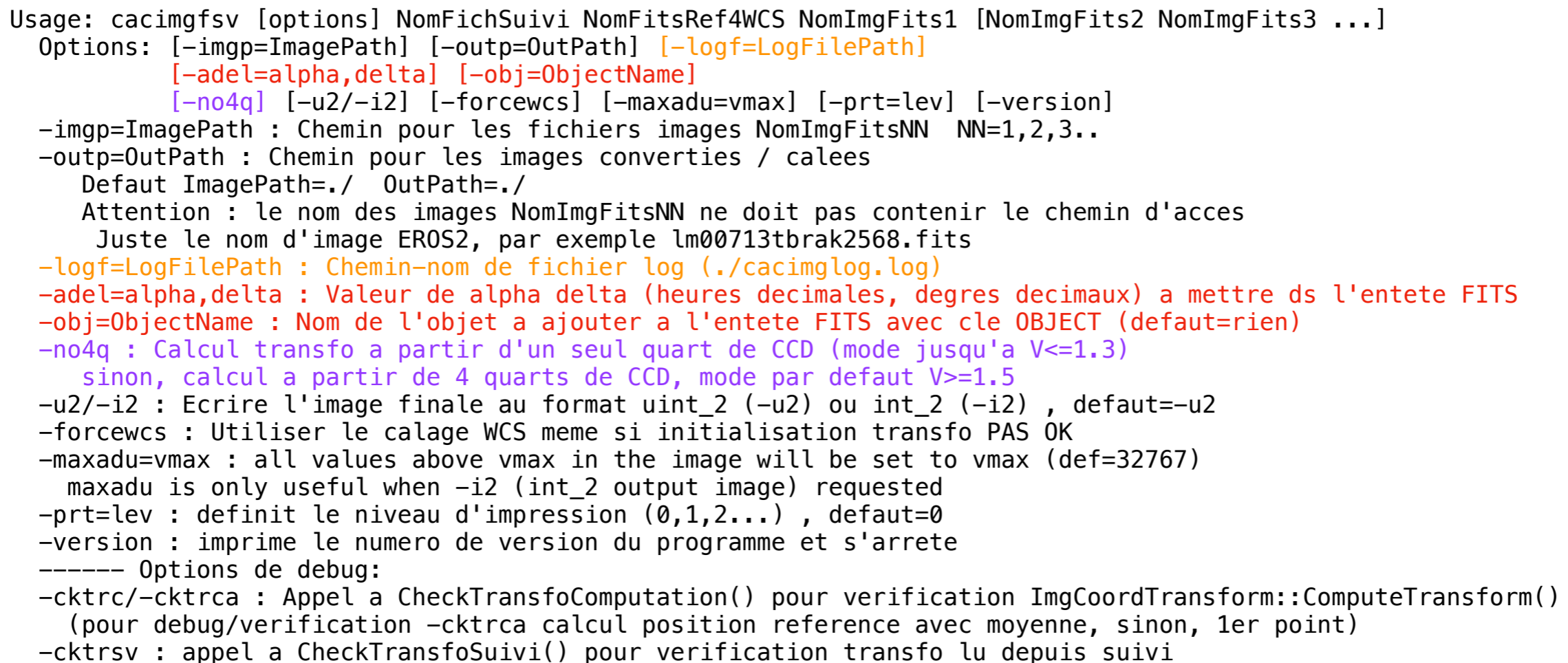
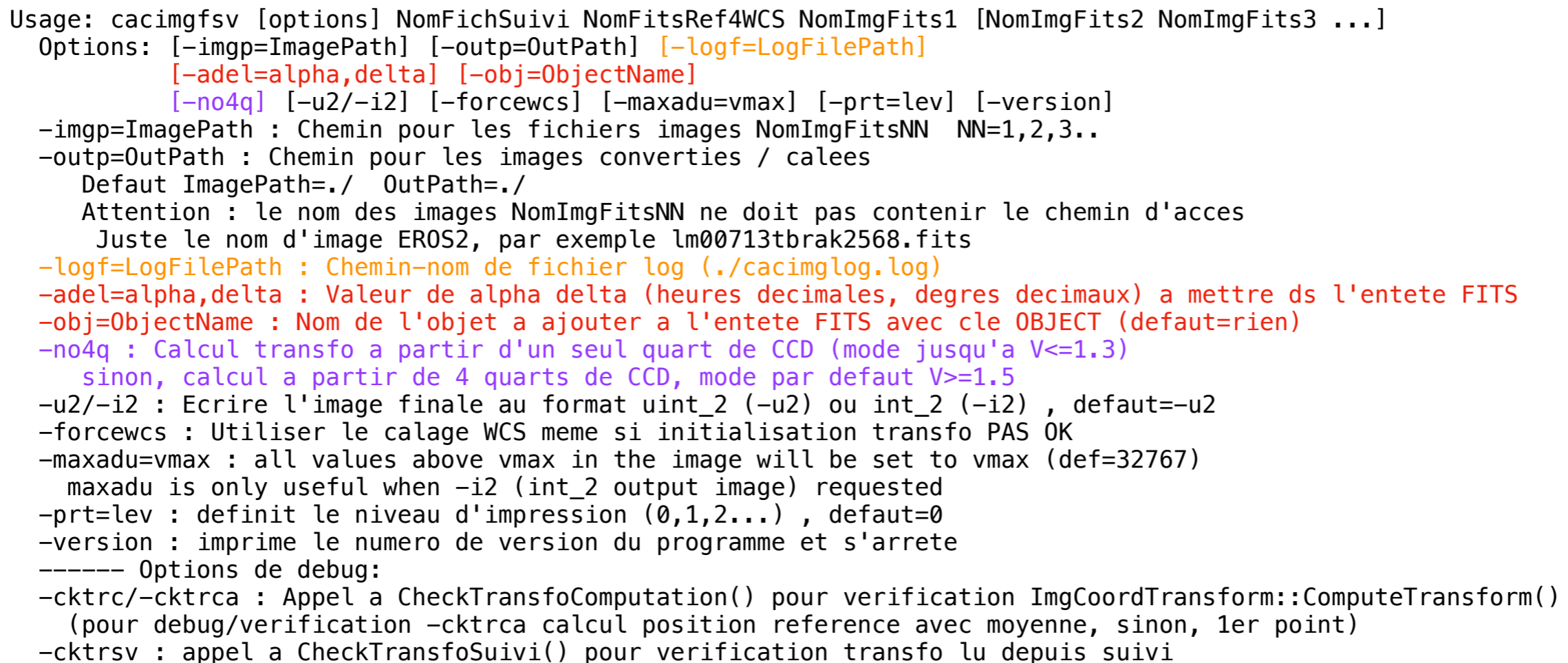
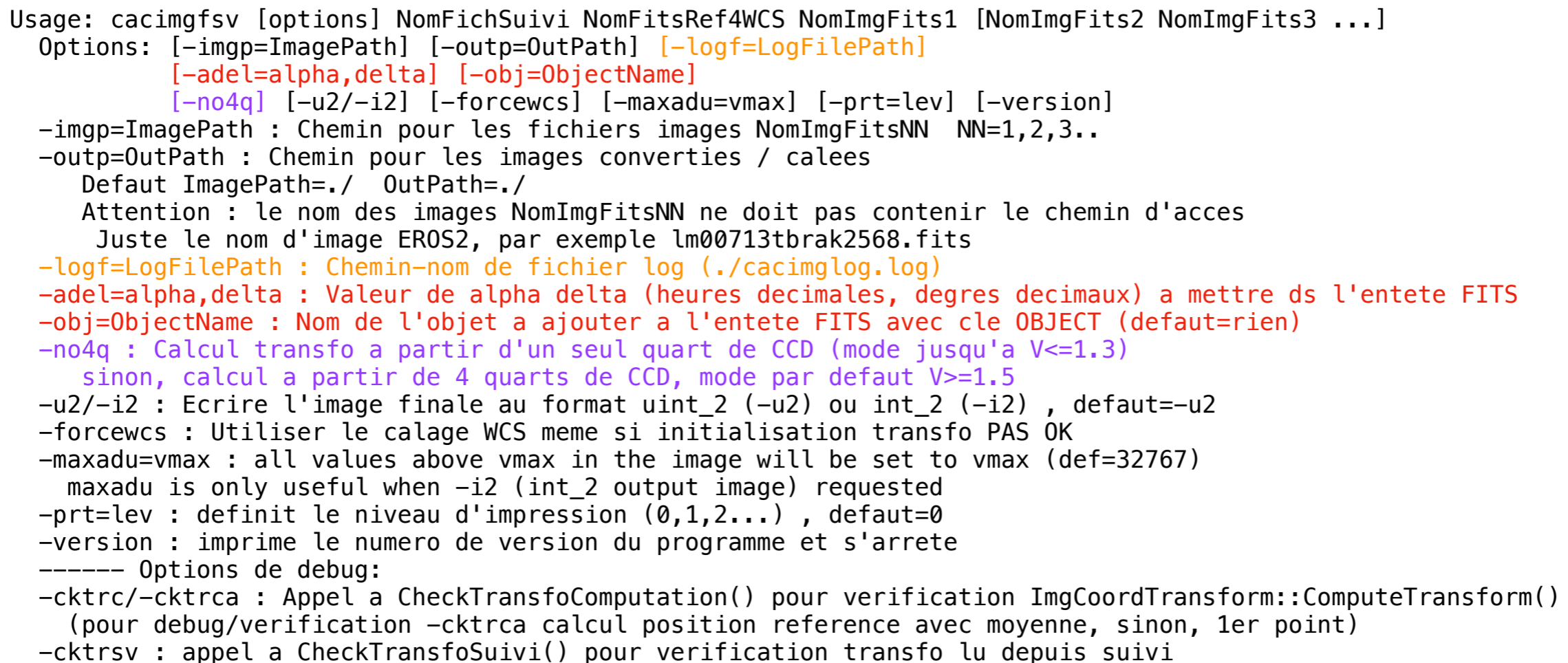
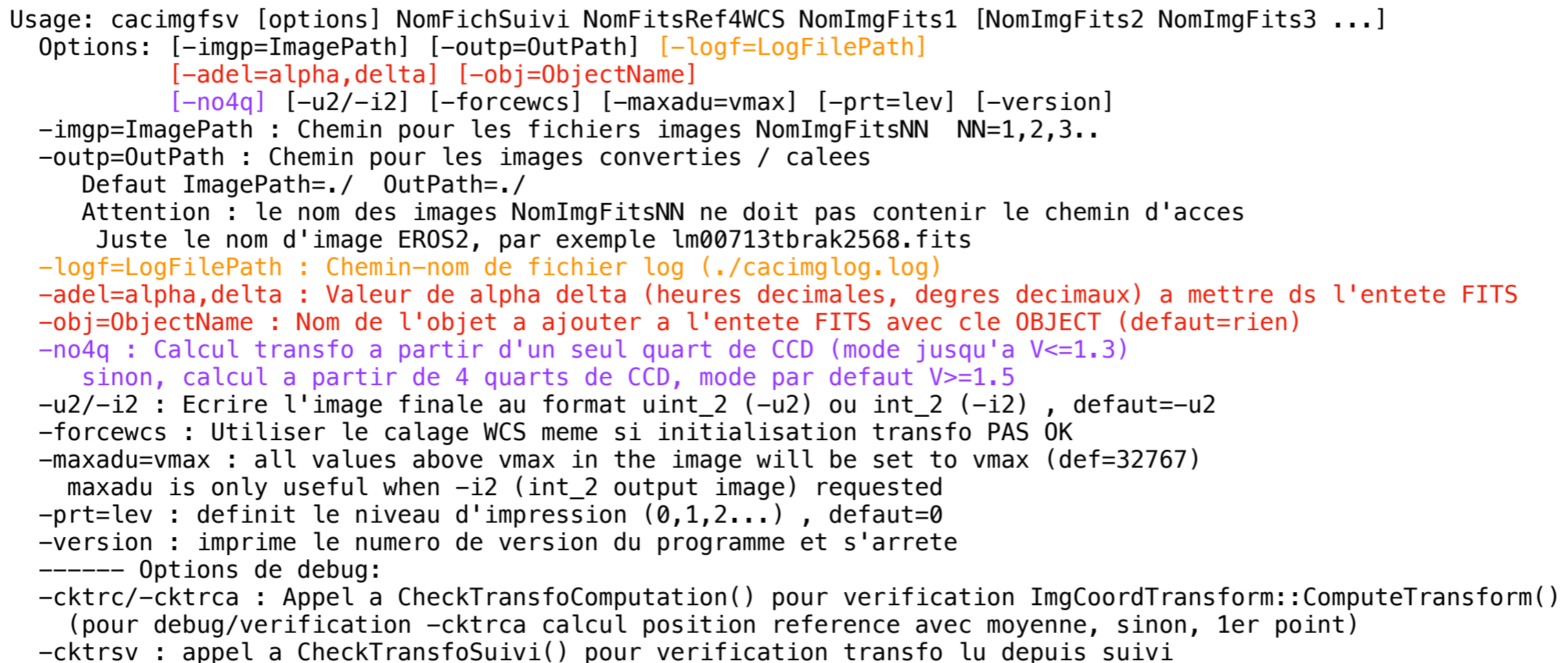
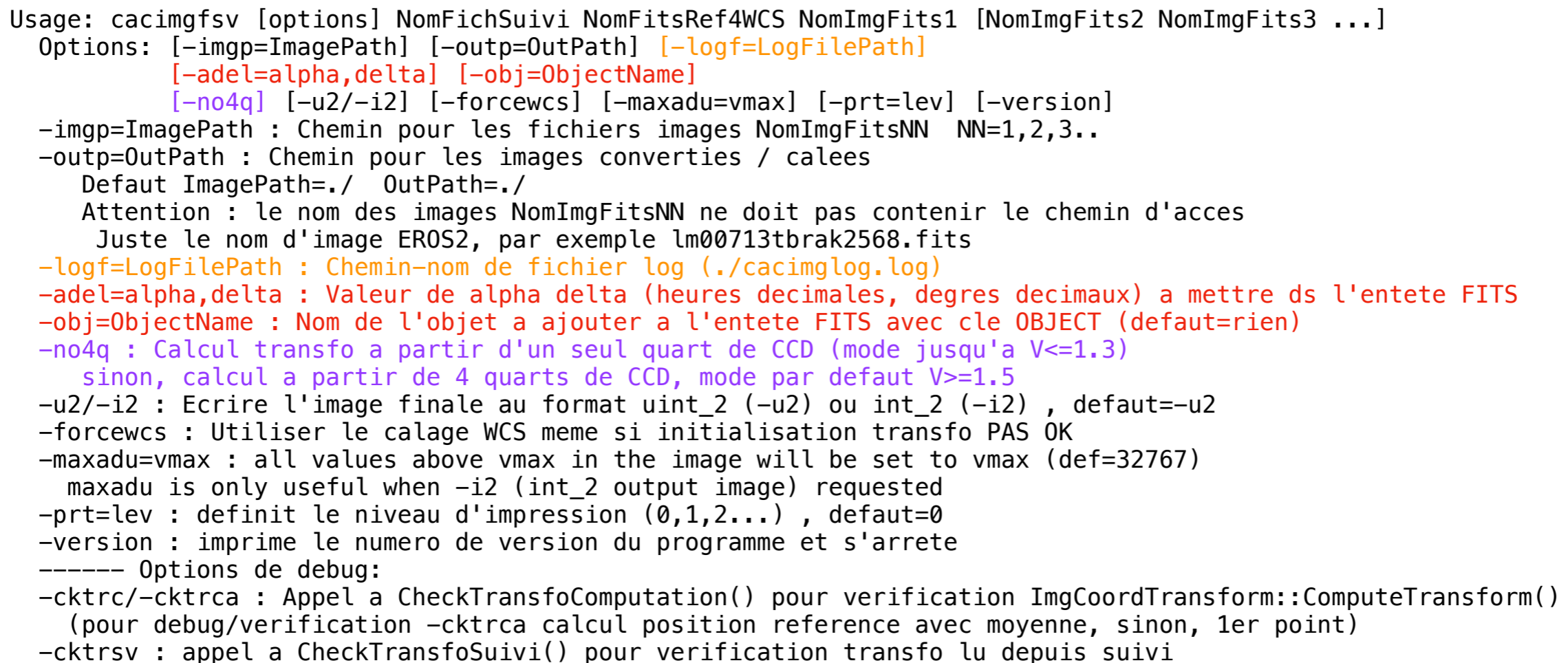
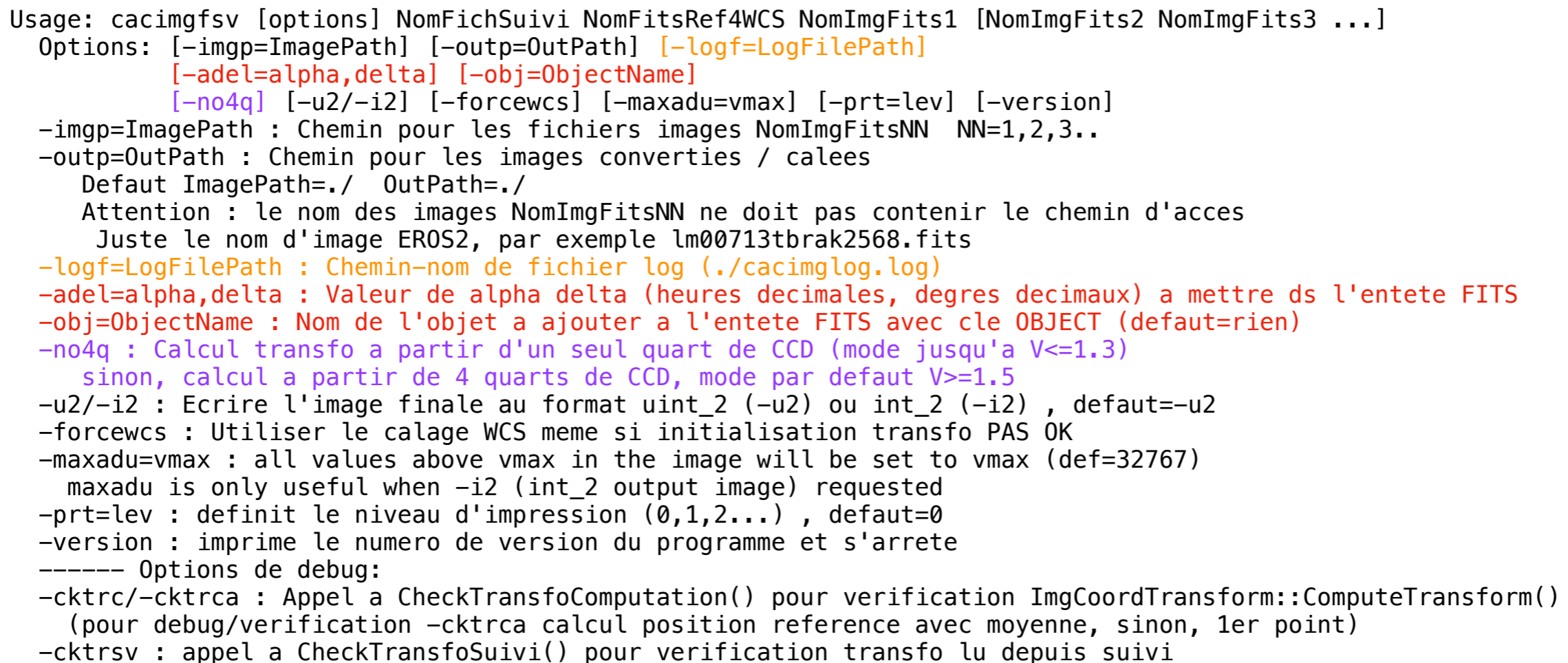
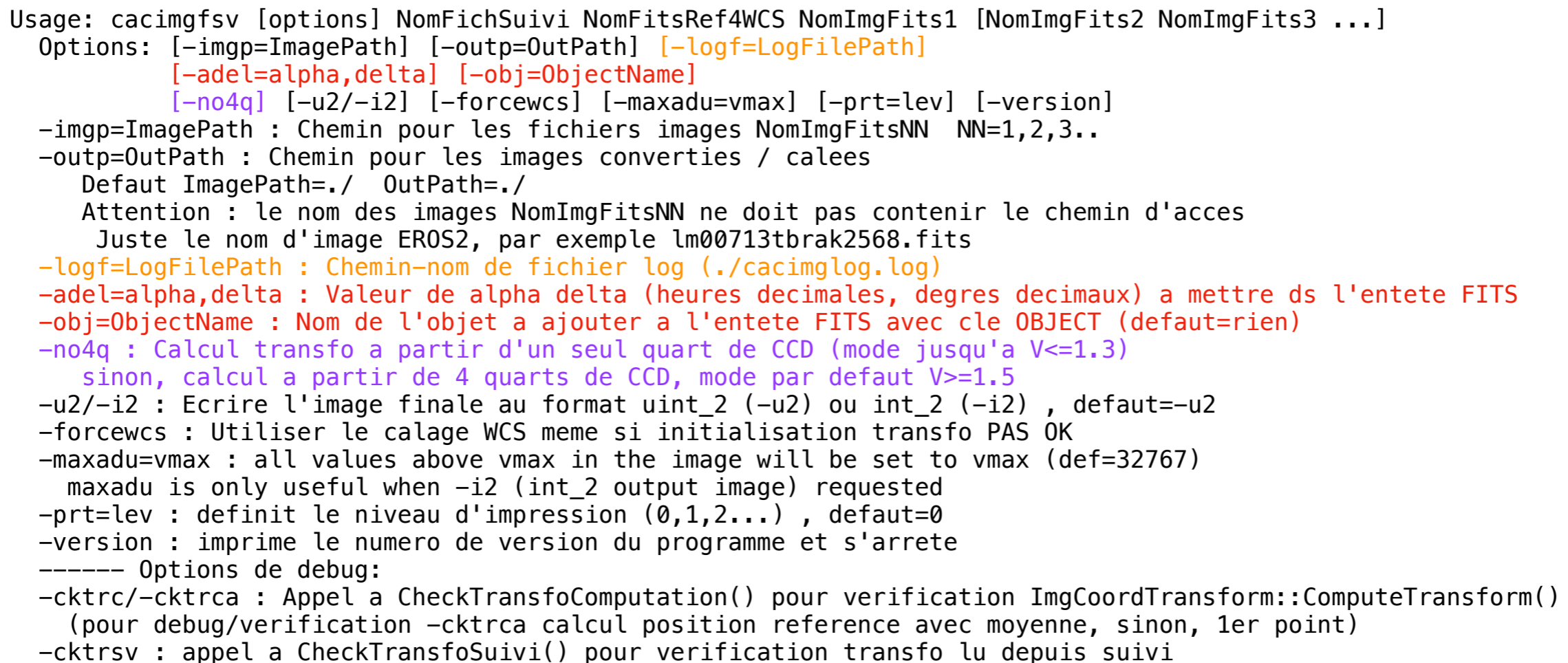
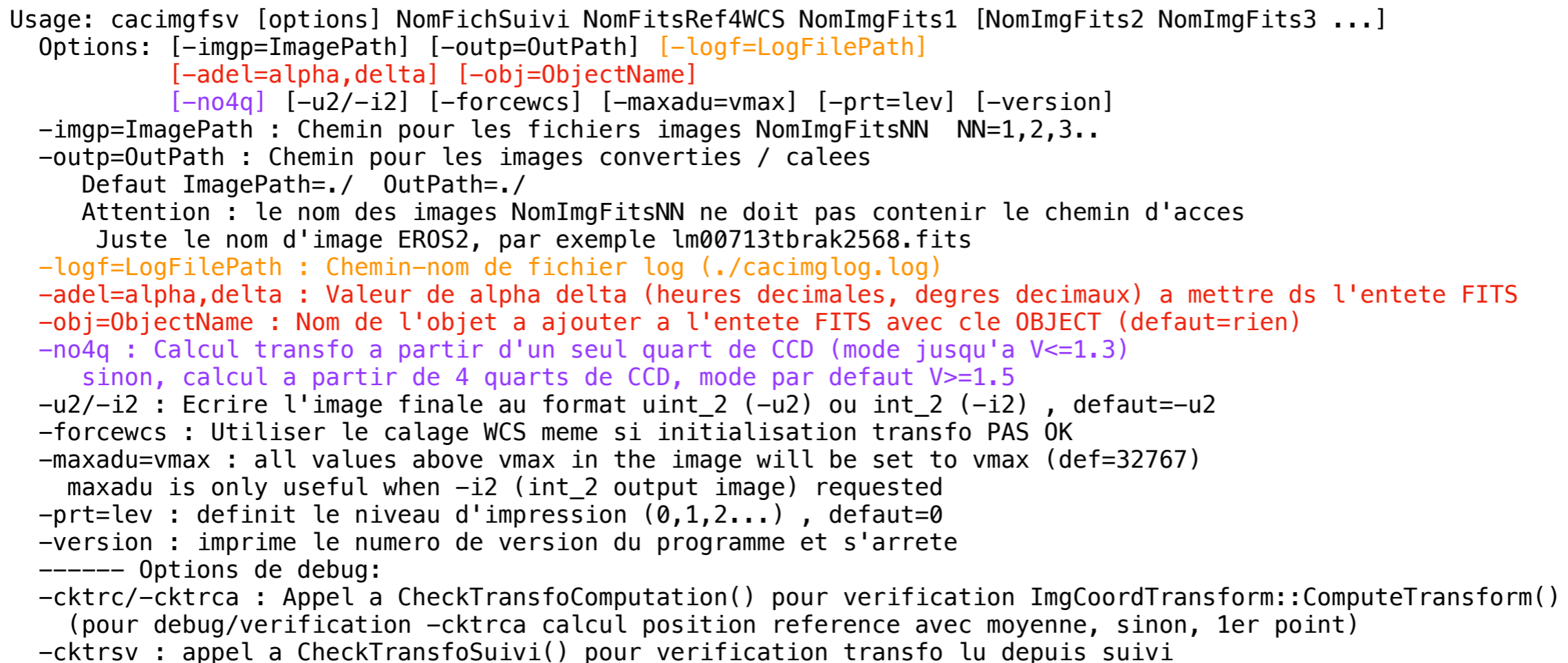
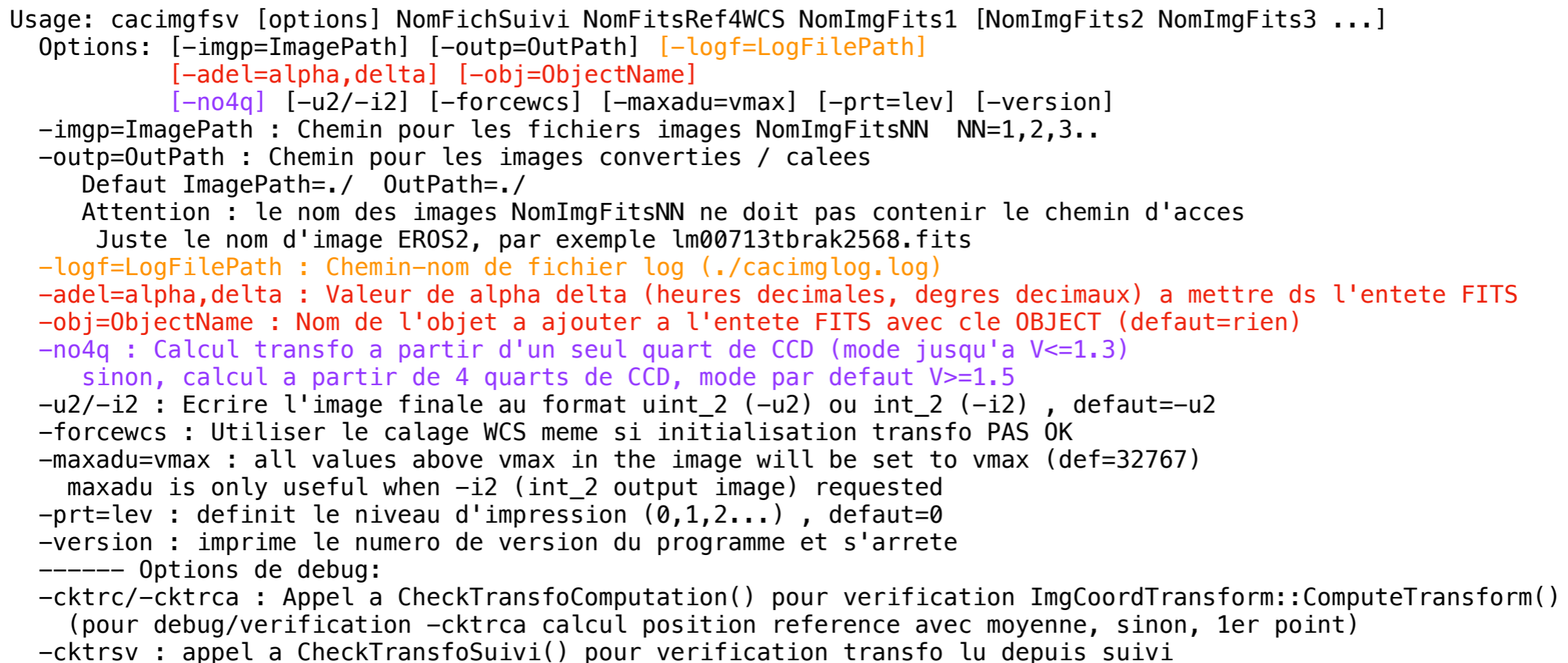
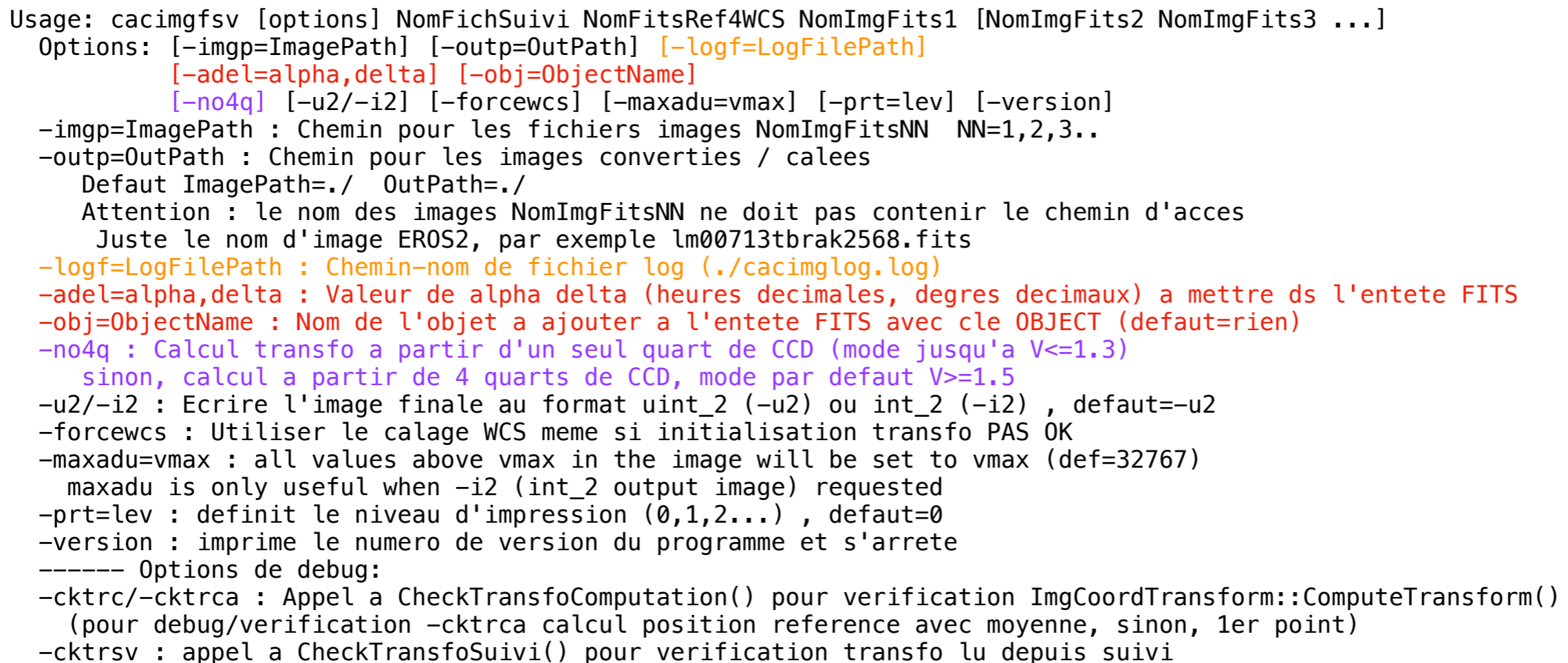
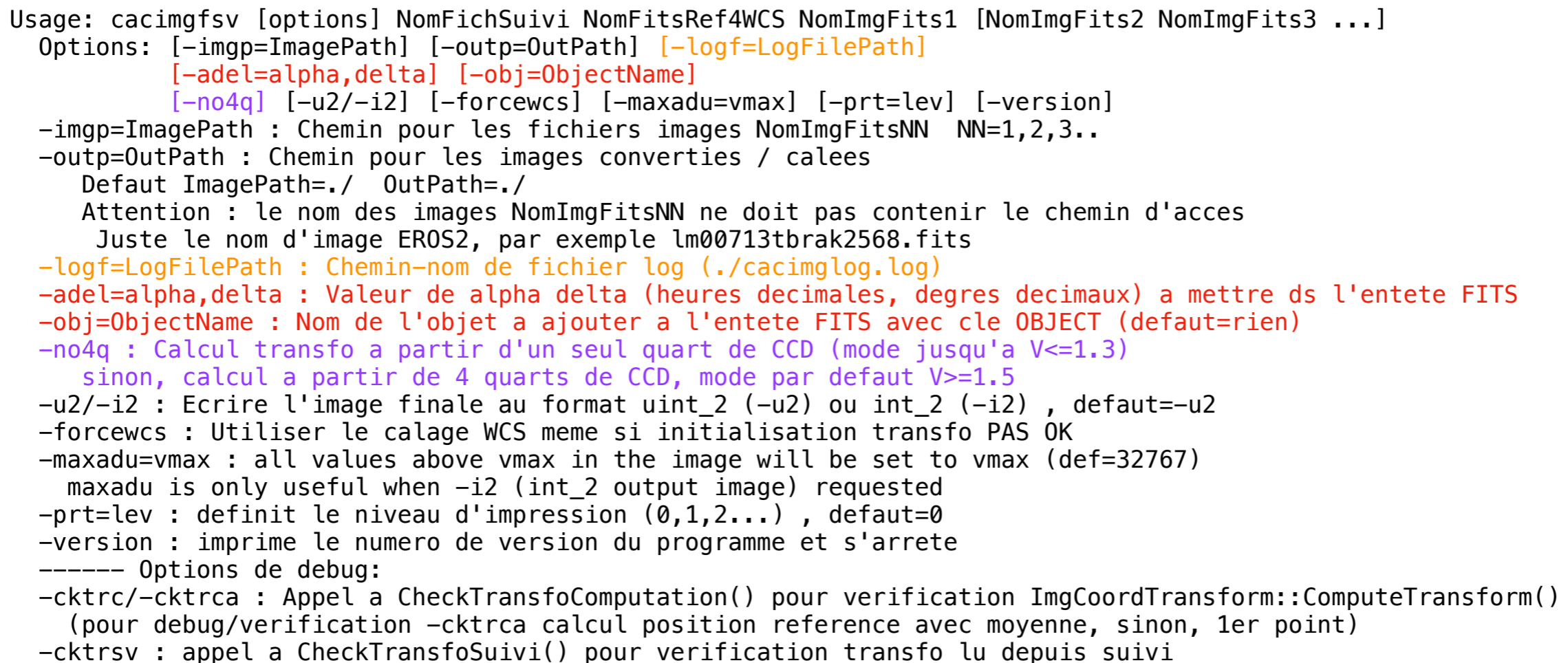
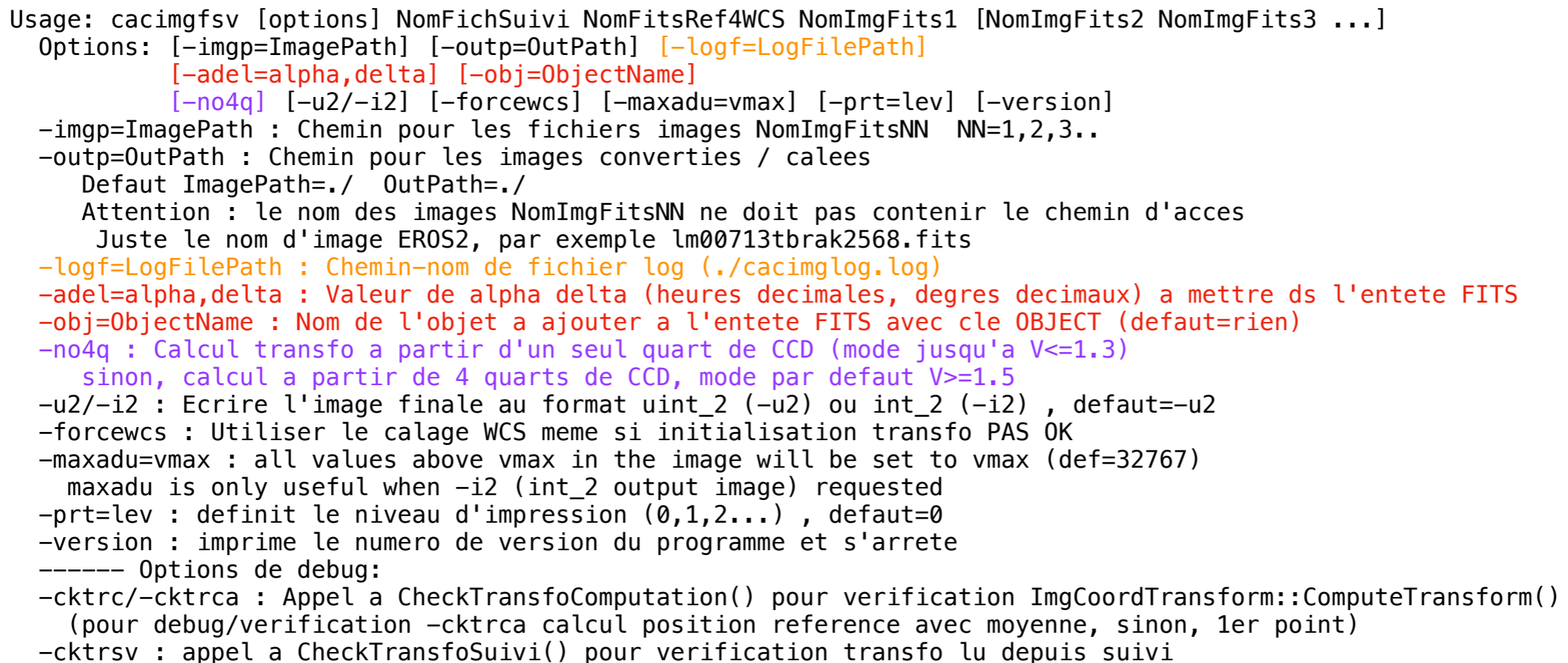
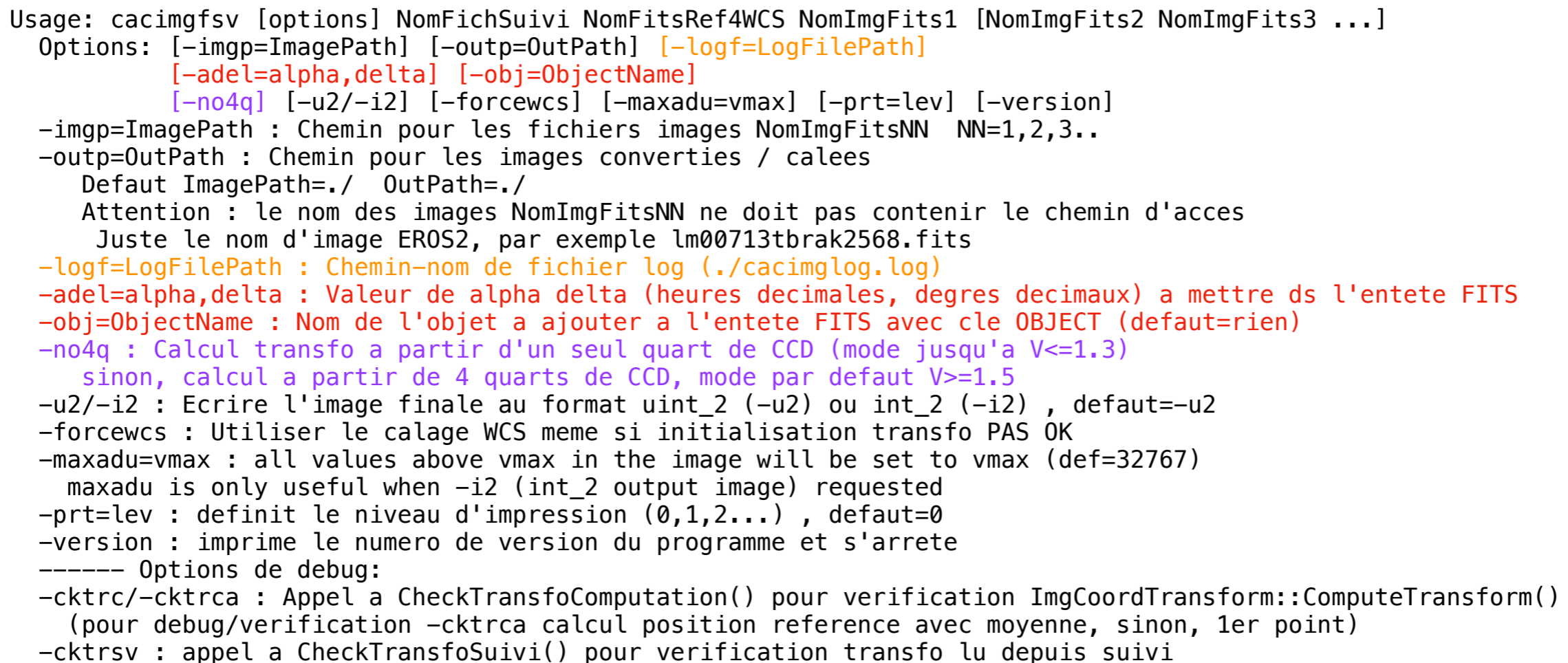
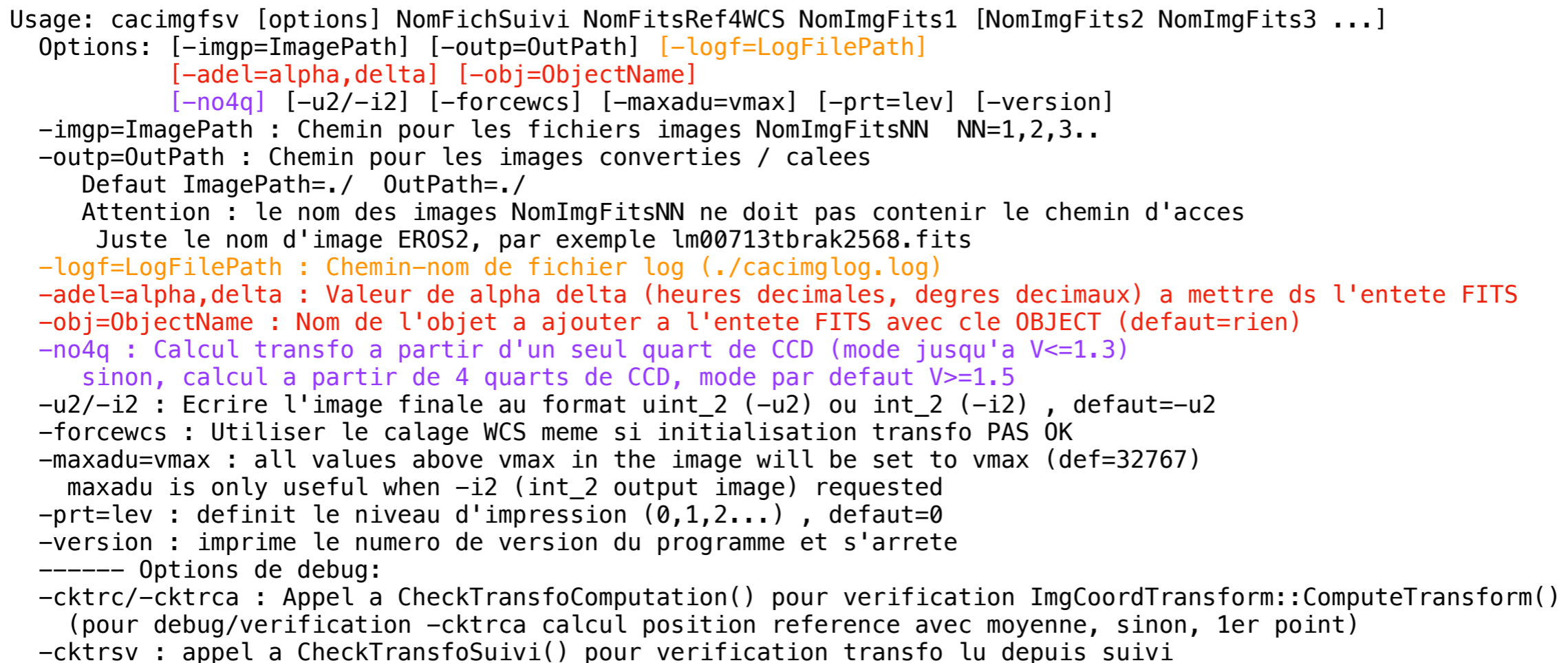
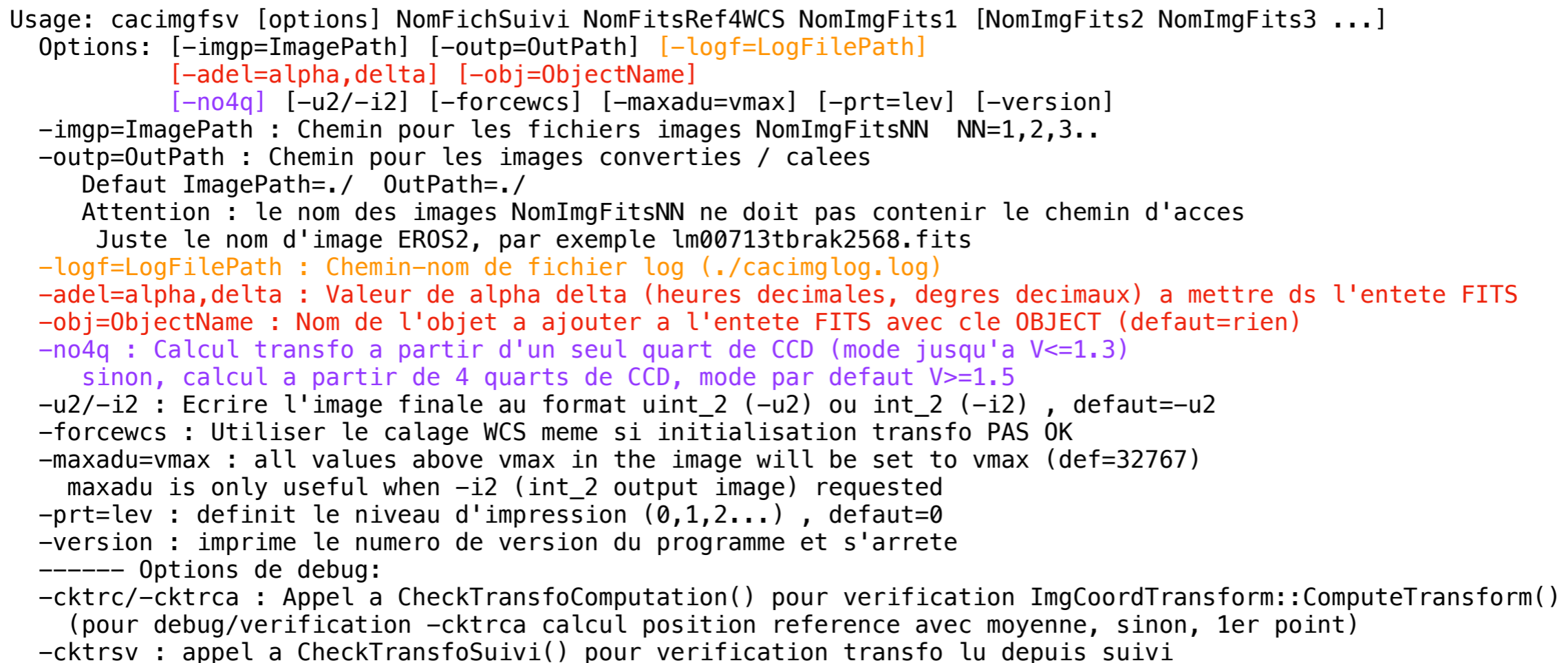
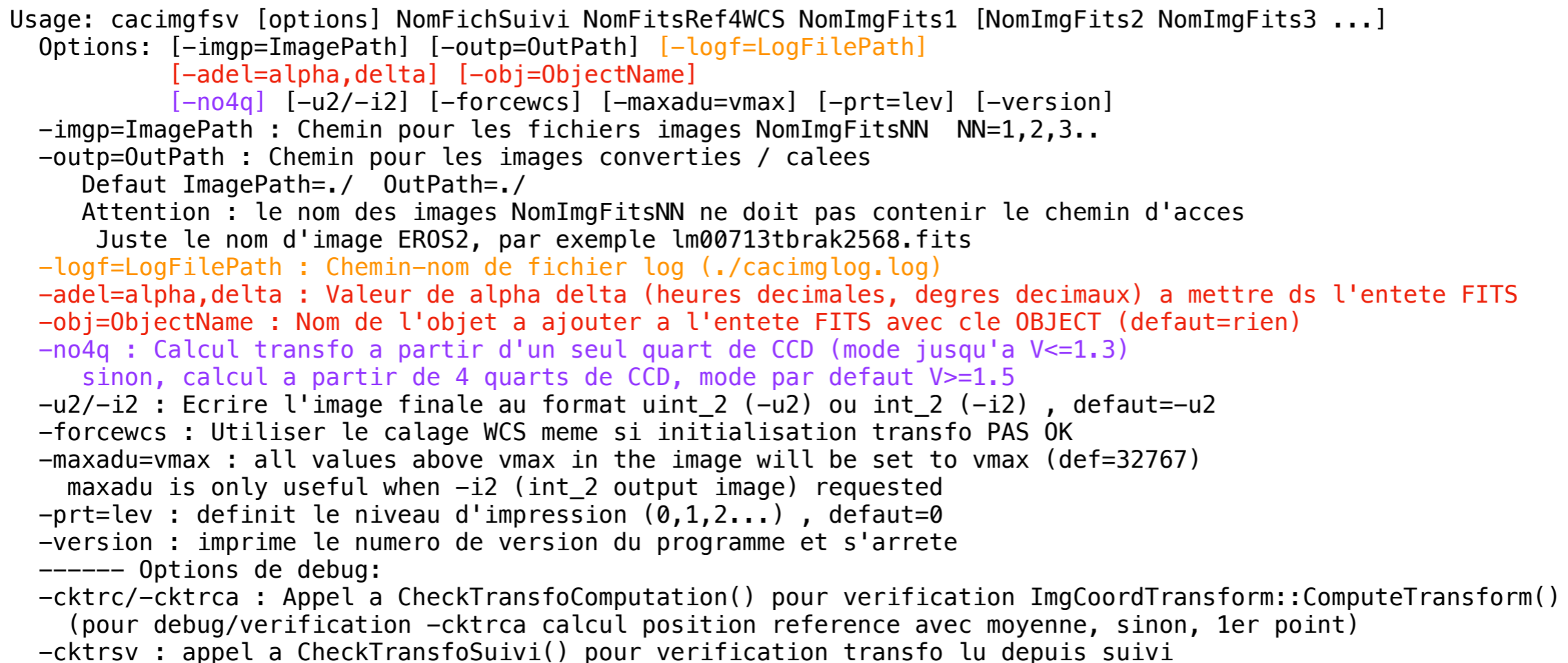
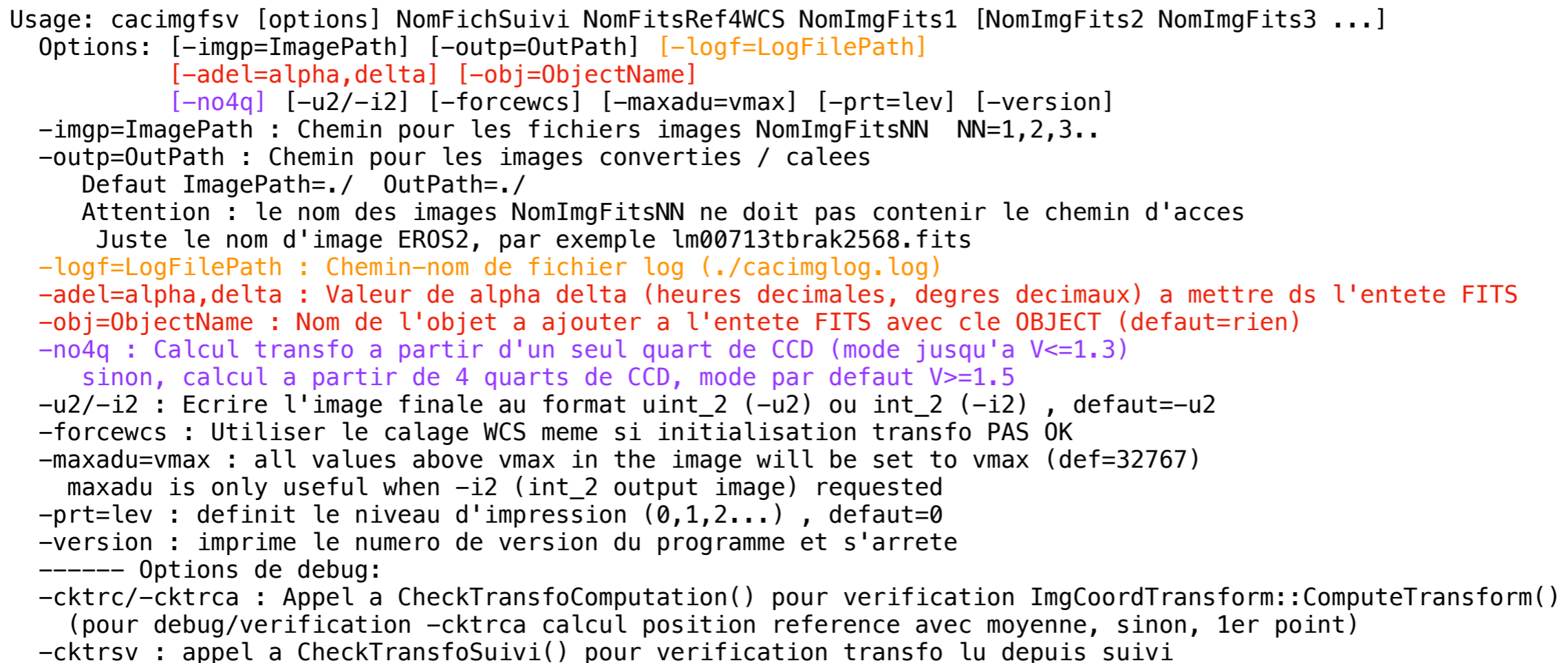
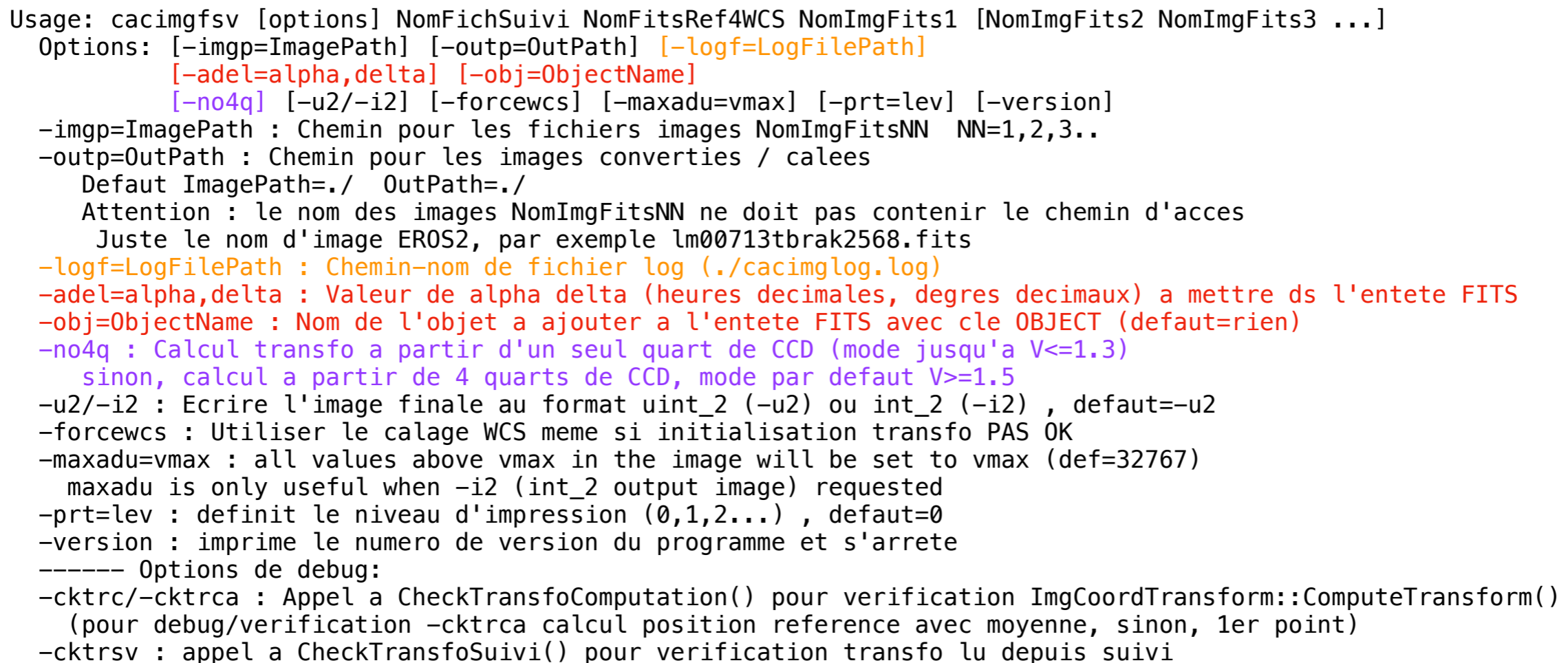
```
Usage: cbszimg [options] NomImgFits1 [NomImgFits2 NomImgFits3 ...]
Options: [-imgp=ImagePath] [-outp=OutPath] [-logf=LogFilePath]
         [-u2/-i2] [-maxadu=vmax] [-prt=lev] [-version]
-imgp=ImagePath : Chemin pour les fichiers images NomImgFitsNN NN=1,2,3..
-outp=OutPath : Chemin pour les images converties / cales
  Default ImagePath=./ OutPath=./
  Attention : le nom des images NomImgFitsNN ne doit pas contenir le chemin d'accès
  Juste le nom d'image EROS2, par exemple lm00713kbc6a3150.fits
-logf=LogFilePath : Chemin-nom de fichier log (./cacimglog.log)
-u2/-i2 : Ecrire l'image finale au format uint_2 (-u2) ou int_2 (-i2) , default=-u2
-maxadu=vmax : all values above vmax in the image will be set to vmax (def=32767)
  maxadu is only useful when -i2 (int_2 output image) requested
-prt=lev : definit le niveau d'impression (0,1,2...) , default=0
-version : imprime le numero de version du programme et s'arrete
```

V=0.6 , 30 Mai 2023

<https://gitlab.in2p3.fr/SCosmoTools/ErosAnaLC>

[cacimgfsv.cc](https://gitlab.in2p3.fr/SCosmoTools/ErosAnaLC) : Conversion images courantes

[cacimgfsv.cc](https://gitlab.in2p3.fr/SCosmoTools/ErosAnaLC) : propagation calage astrométrique de l'image de référence sur chaque image courante, en utilisant les transfos dans les fichiers de suivi, changement des axes dans le même sens que les images de référence avec astrométrie, écriture conforme à la norme FITS avec BSCALE, BZERO - image de sortie code de traitement **e**

```
Usage: cacimgfsv [options] NomFichSuivi NomFitsRef4WCS NomImgFits1 [NomImgFits2 NomImgFits3 ...]
Options: [-imgp=ImagePath] [-outp=OutPath] [-logf=LogFilePath]
         [-adel=alpha,delta] [-obj=ObjectName]
         [-no4q] [-u2/-i2] [-forcewcs] [-maxadu=vmax] [-prt=lev] [-version]










































































































































































```

Comparaison propagation calage 4 quarts et 1 quart de CCD

Analyse par Christophe Magneville

Conclusion :

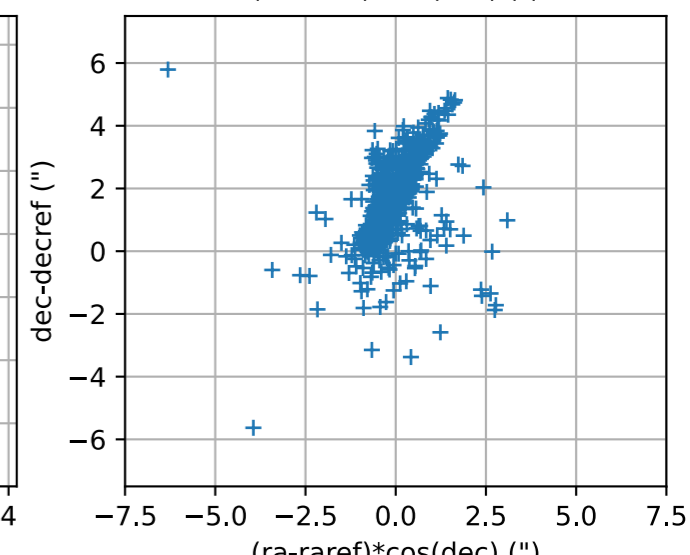
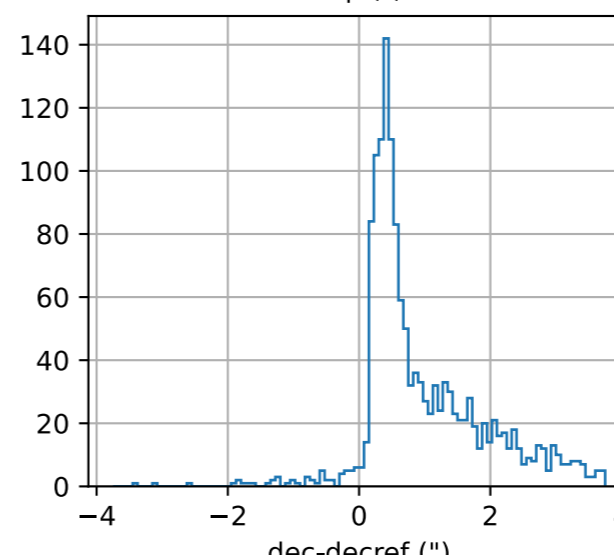
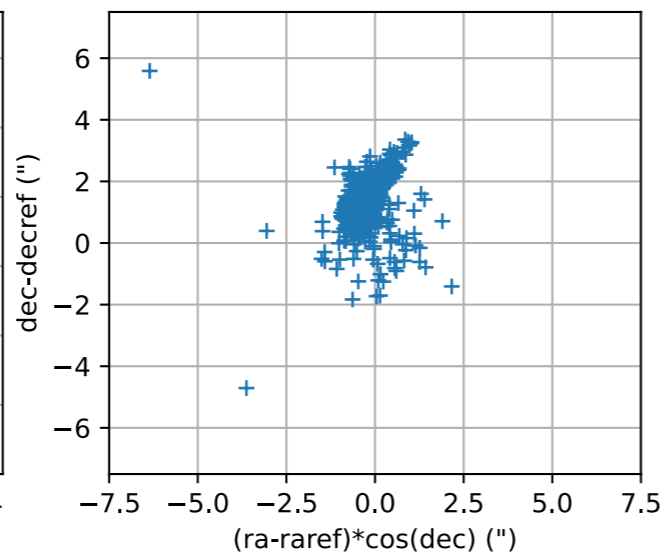
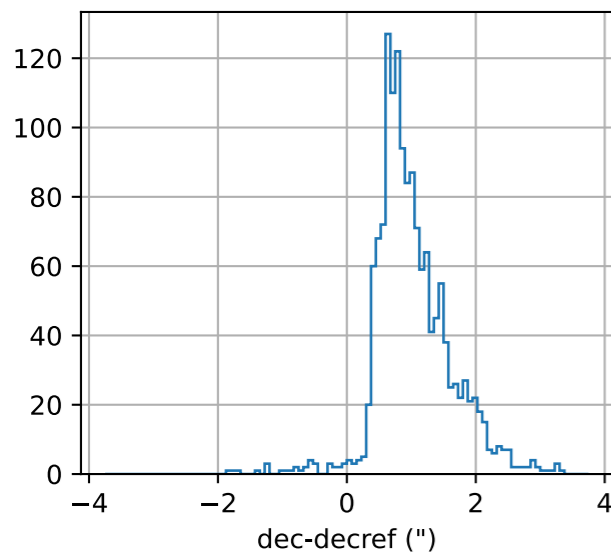
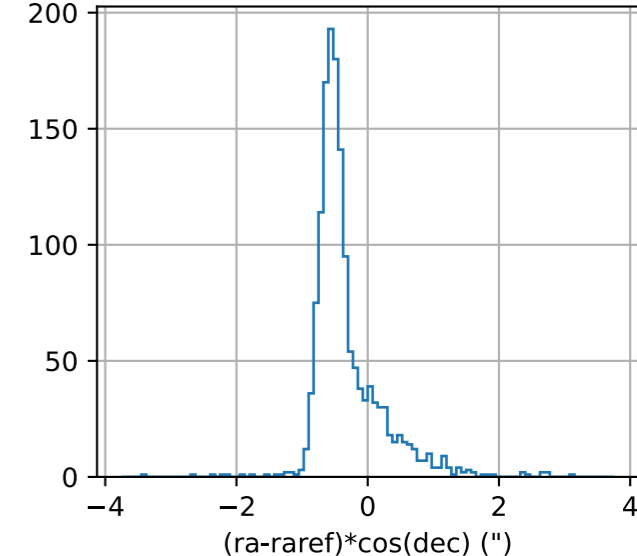
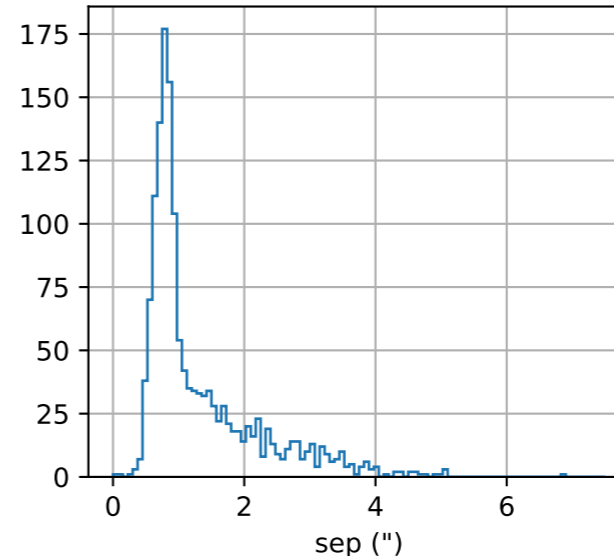
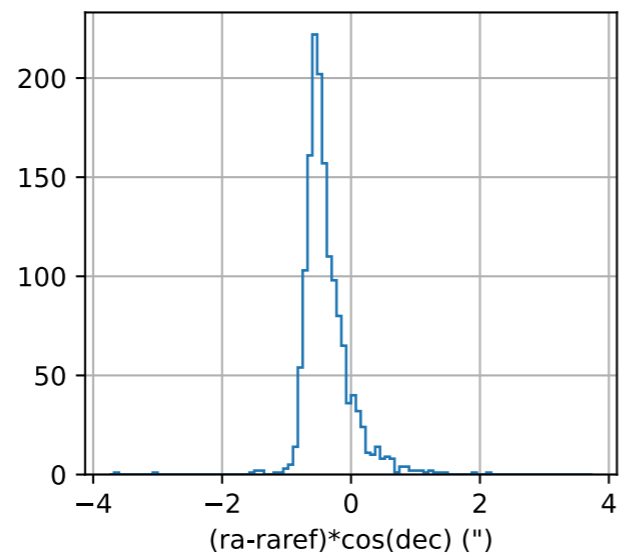
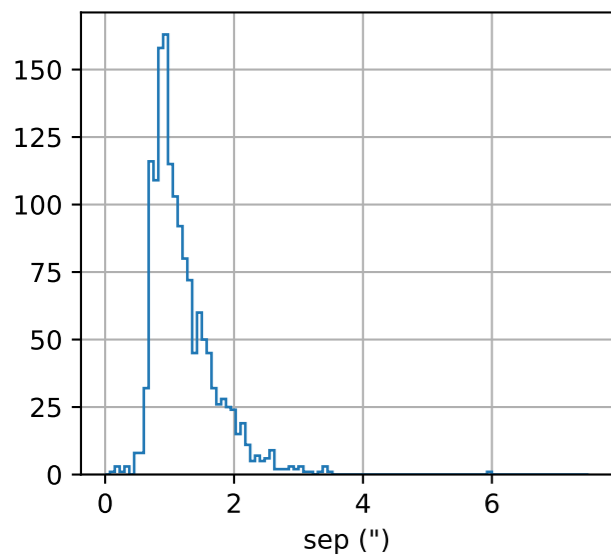
- Distorsions importantes sur le plan focal, y compris sur un seul CCD, effet moins prononcé sur les CCD's centraux.
- Calage 4 quarts améliore marginalement les résidus
- Il faut faire un calage avec des termes non linéaires pour passer en dessous de la seconde d'arc
- On a décidé de revenir au calage 1 quart de CCD

Lm05511tbeca2947

CCD #1 - au bord

4 quarts

1 quart



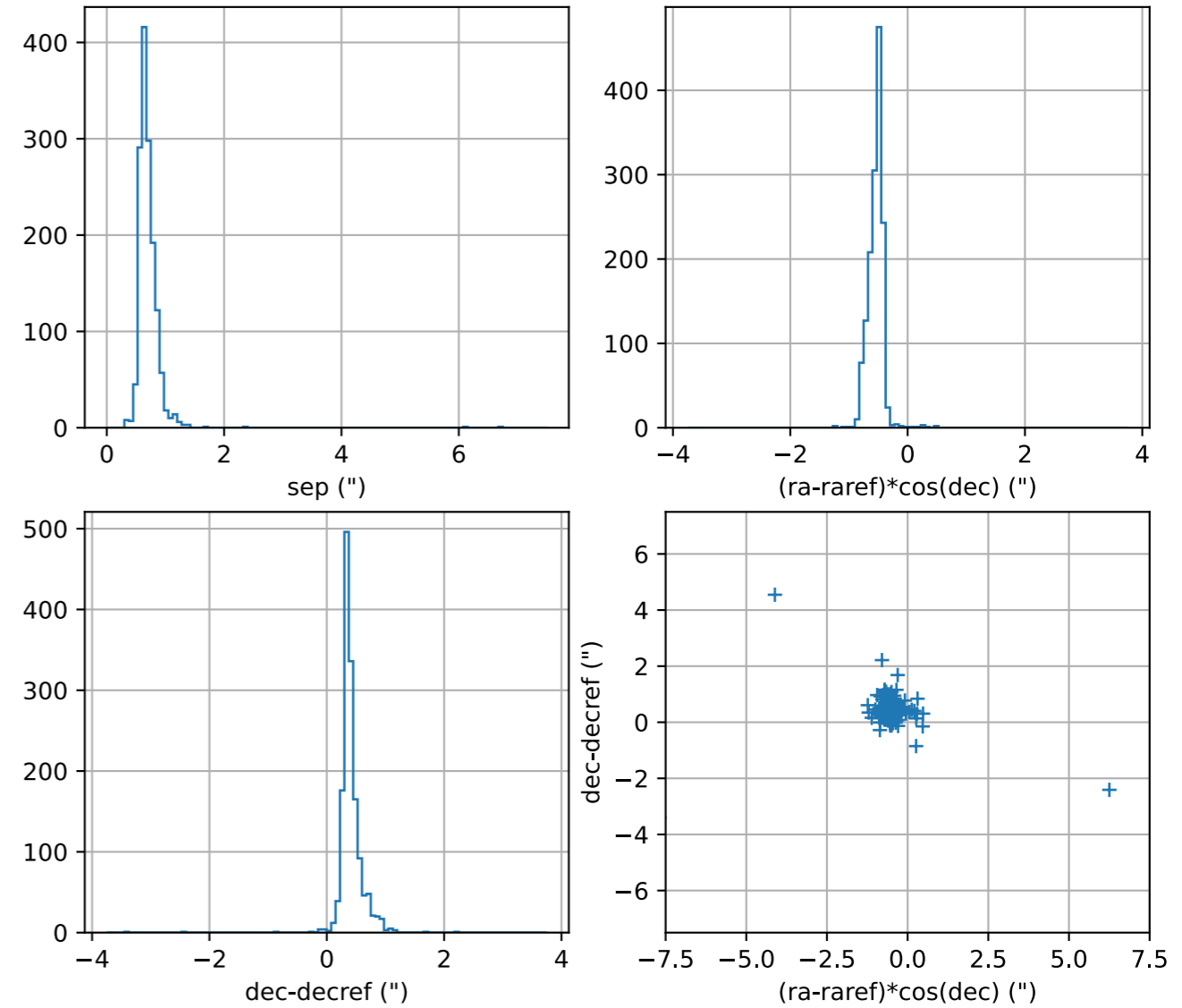
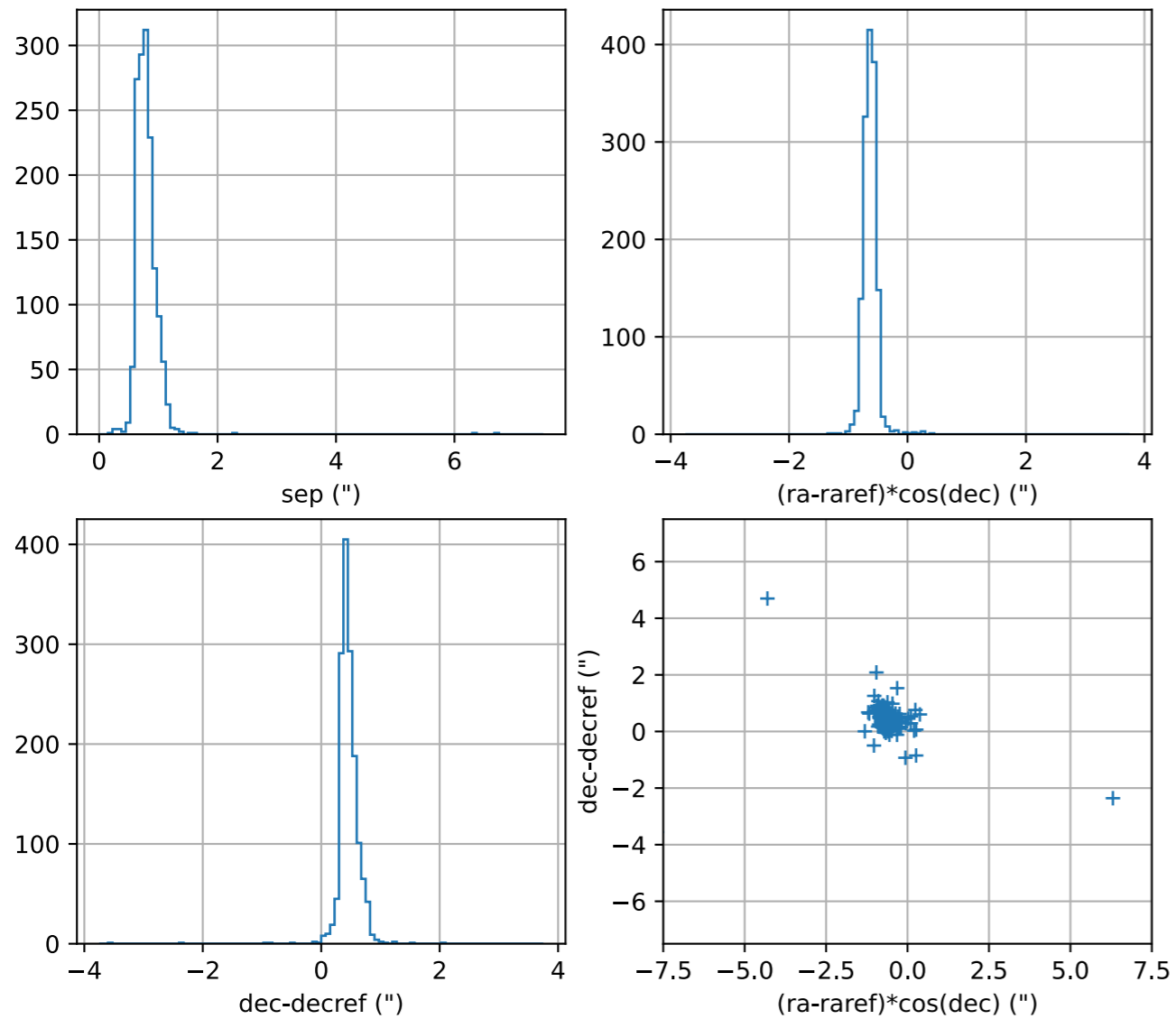
4 quarts améliorée
Dispersion au delà de 2" quand même

Lm05502treca2947

CCD #2 - central

4 quarts

1 quart



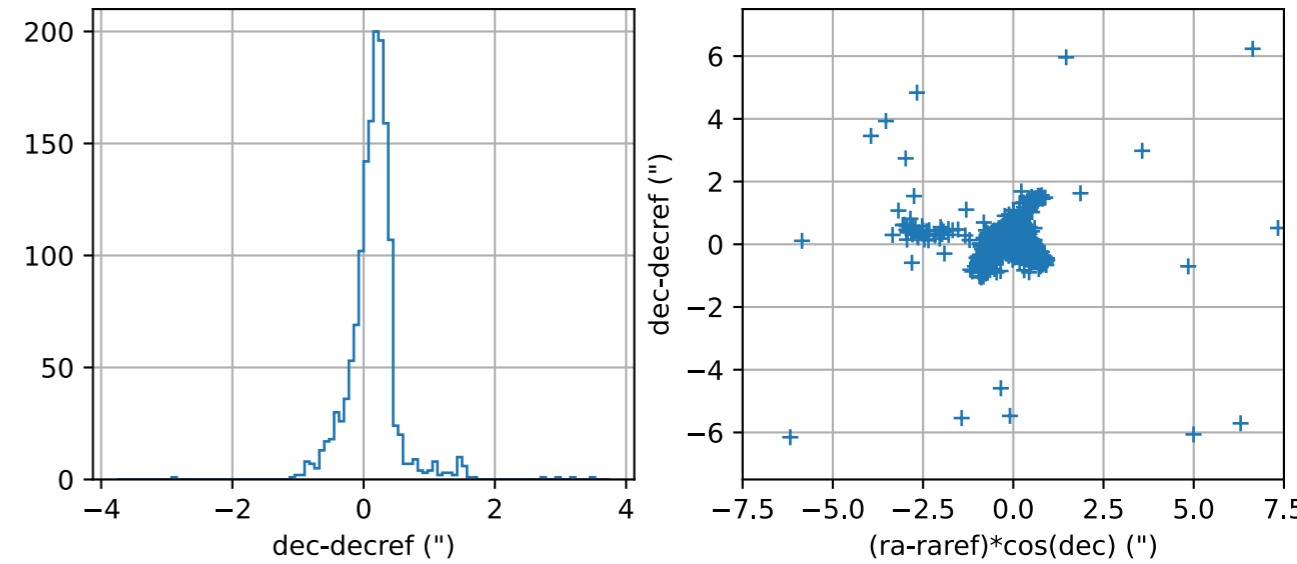
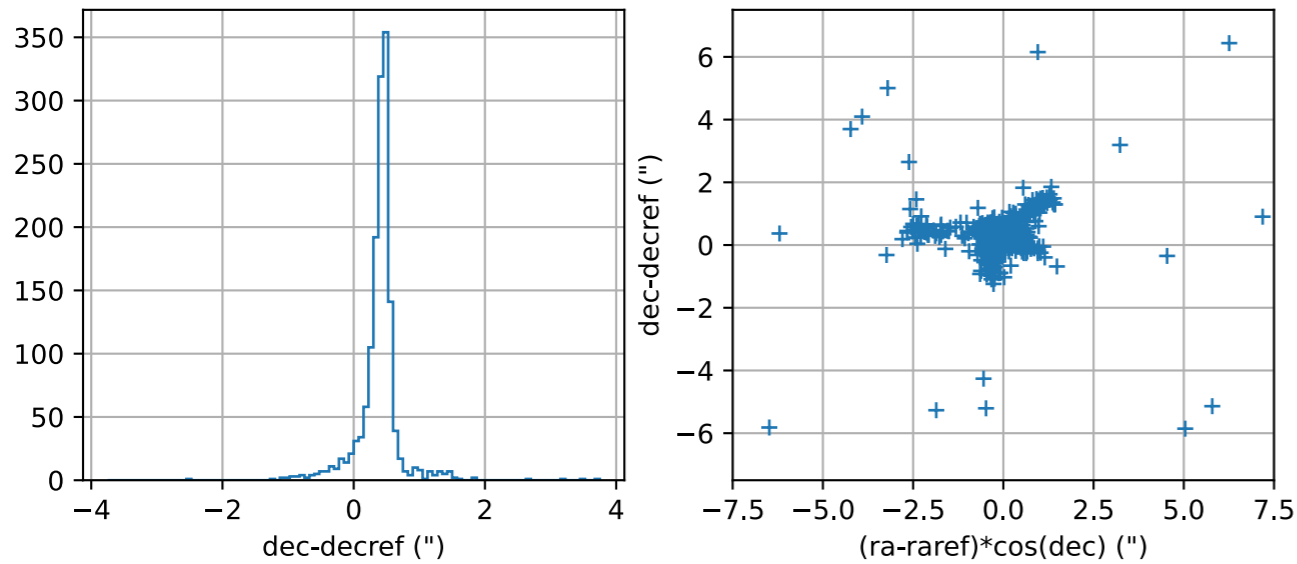
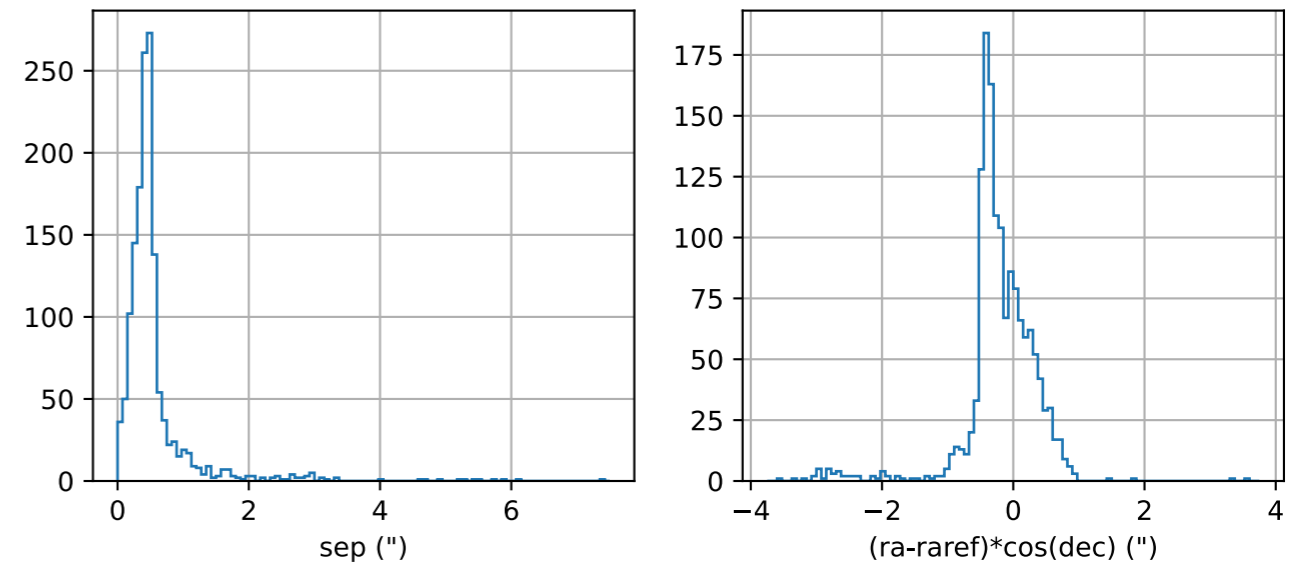
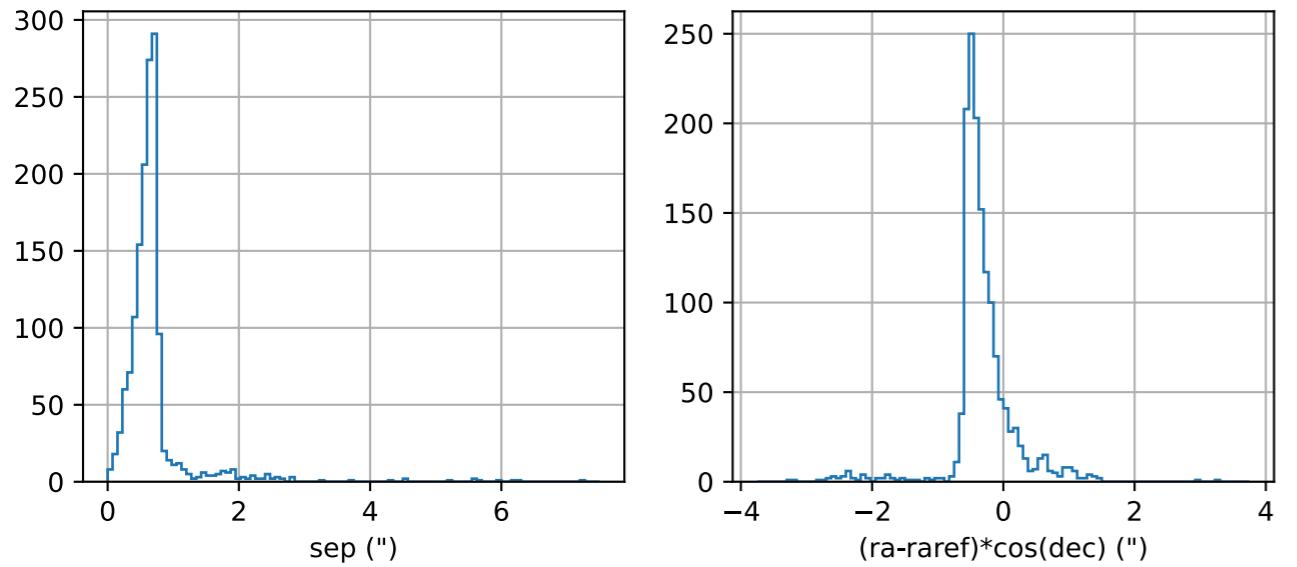
4 quarts ne fait pas mieux
Ecart peu dispersés (CCD
parmi les 4 centraux

Lm05505treca2947

CCD #5 - au centre

4 quarts

1 quart



4 quarts fait moins bien ?
Ecart dispersés , malgré CCD
parmi les 4 centraux

jread.cc : relecture fichiers CdL ascii produit par Jim

read.cc : lecture fichiers CdL ascii pour un ou plusieurs CCD d'un champ, calcul de quelques quantités - moyennes/médian/sigma le long de la courbe de lumière et écrite de tables en sortie en FITS (BINTABLE)

```
---- jread()/ Missing argument or jread -h (help) :
Usage: jread [options] ObjName Field CCD's OutFile
options:  [-ext] [-path=Path] [-nlc=NLCsave] [-prt=lev]
* ObjName : EROS object name (lm , sm , ...)
* Field : EROS field number (champ) : 001 002 ...
* CCD's : CCD's (0...7) first,last to be processed
* OutFile : Output file path, either type .fits or .ppf
  Four Tables (StarCatalogue, TimeInfo and LCsummary, CatLC) will be saved
  to output file - and optionally individual light curves if NLCsave>0
  Note that light curves are sorted with increasing magnitudes (MagR)
  so the light curve for NLCsave brightest stars will be saved
Options/flags:
* -ext : read extended .xxcat and .xxtinfo StarCatalogue and TimeInfo files
* -path=Path : Base path for catalog files: Path/Xcat Path/Xtinfo Path/Xtime
* -nlc=NLCsave : save NLCsave lightcurves (default=0)
* -prt=lev : print level (default=0)
```

Scripts de production

Plusieurs scripts (bash) emboîtés pour la production des images - Voir ErosAnaLC/Scripts et ErosAnaLC/Scripts/README pour une brève description

Soumission en batch (compte erosprod)
job de 3 heures pour un champ

```
sh> cd RzCDS
sh> ./bsub_prod_img.sh -h
-----
bsub_prod_img.sh Objet Champ [PRODDIR]
  Objet=lm, sm ... , Champ=005 007 018 ...
-----
```

Exemple:

```
sh> ./bsub_prod_img.sh lm 009
Résultats dans : /sps/eros/users/erosprod/CDS/ProdImages
```

Scripts (bash) relecture des fichiers ascii CdL par jread.cc

Soumission en batch (compte erosprod)
Un job de 5 heures pour un champ

```
sh> cd RzCDS
sh> ./jr_bsub.sh -h
-----
jr_bsub.sh Objet Champ [PRODDIR]
  Objet=lm, sm ... , Champ=005 007 018 ...
-----
```

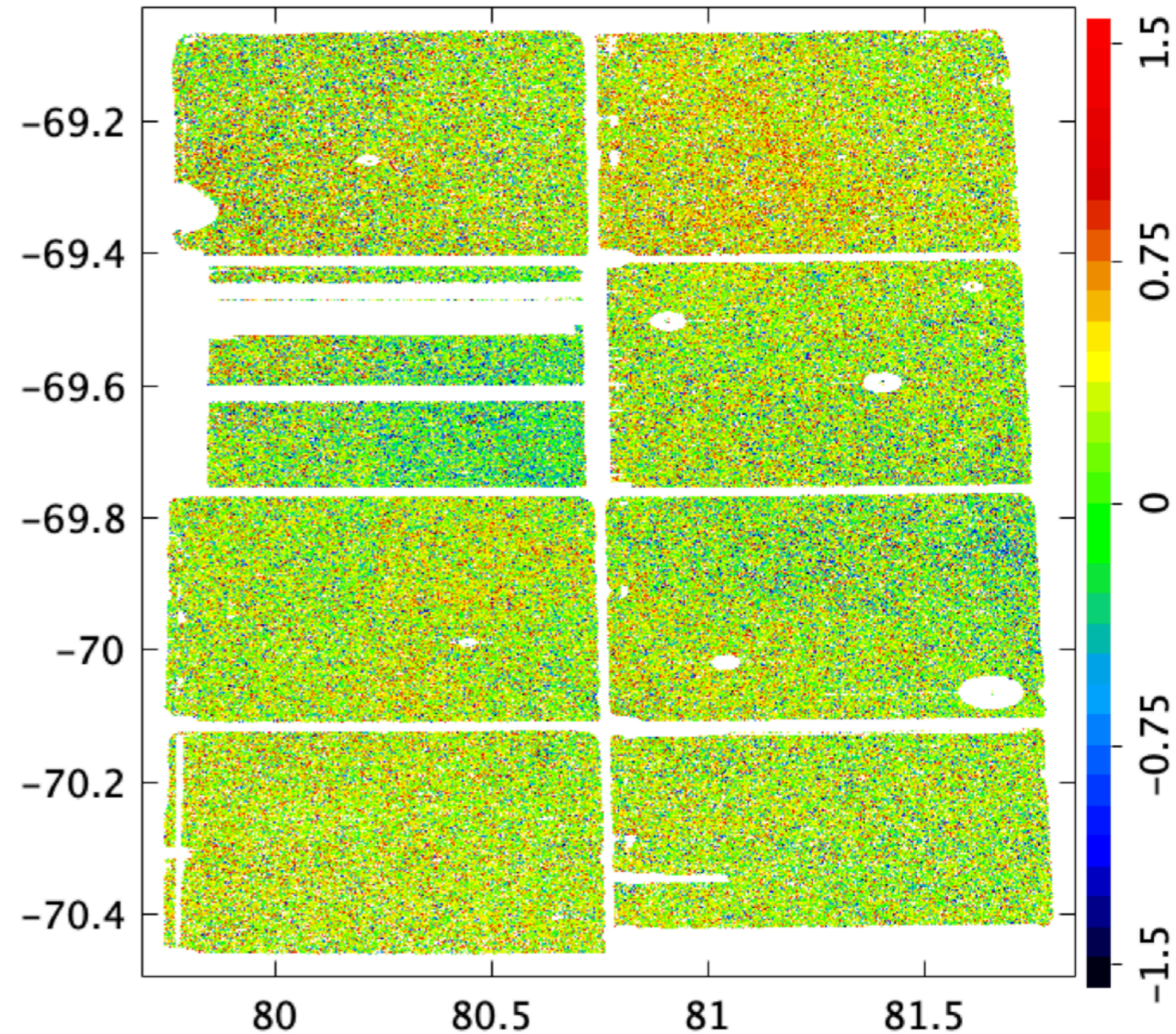
Résultats dans : /sps/eros/users/erosprod/CDS/CheckJRead

Table catcdl produit par jread.cc

NamedObjMgr::PrintObj(/home/catcdl) Type: N6S0PHYA9DataTableE
 BaseDataTable: NVar= 36 NEnt= 583832 (SegSize= 512 NbSegments= 1141)

i:	Name [Sz] (Typ)	Min	Max
0:	erosid (S16)	-	-
1:	Ra (F)	79.7429	81.7976
2:	Dec (F)	-70.458	-69.0636
3:	MagR (F)	12.378	99.999
4:	ErrMR (F)	0.005	1188.42
5:	XR (F)	78.32	1686.98
6:	YR (F)	100	1667.74
7:	MagB (F)	12.487	99.999
8:	ErrMB (F)	0.006	1648.87
9:	XB (F)	43.97	1655.41
10:	YB (F)	128.11	1707.6
11:	fluxr (F)	0.02	834238
12:	fluxb (F)	0.42	991879
13:	nlc (I)	280	663
14:	medianr (F)	12.378	21.264
15:	sigpullr (F)	0.23	479.636
16:	medianb (F)	12.487	21.803
17:	sigpullb (F)	0.25	1436.1
18:	erosid_cdl (S16)	-	-
19:	moymagr (F)	12.4064	21.4523
20:	sigmagr (F)	0.00572198	3.03474
21:	okcntmagr (I)	96	574
22:	moymagb (F)	12.6048	21.9842
23:	sigmagb (F)	0.00730596	2.91348
24:	okcntmagb (I)	106	630
25:	moyflxr (F)	274.008	851139
26:	sigflxr (F)	172.291	478919
27:	wmoyflxr (F)	-565.702	718900
28:	chi2redflxr (F)	0.0542196	inf
29:	okcntflxr (I)	96	574
30:	moyflxb (F)	261.172	1.32206e+06
31:	sigflxb (F)	179.239	922704
32:	wmoyflxb (F)	-82.768	1.07858e+06
33:	chi2redflxb (F)	0.0616155	inf
34:	okcntflxb (I)	106	630
35:	champccdq (I)	1001	8004

RA-DEC for Im001, color encoded with MagB-MagR



Error in champccdq=100*champ+10*(ccd+1)+numq corrected