In [ ]:
```
# PROBLEMA 1
# APARTADO A
import astropy.constants as const
import astropy.units as u
import numpy as np
M = (const.M_sun).to(u.kg).value    # mass of the sun in kg
print('La masa del sol es:',M,'kg')
R = (const.R_sun).to(u.m).value      # radius of the sun in meters
print('El radio del sol es:',R,'m')
m = (const.M_earth).to(u.kg).value   # mass of the earth in kg
print('La masa de la tierra es:',m,'kg')
r = (const.R_earth).to(u.m).value    # radius of the earth in meters
print('El radio de la tierra es:',r,'m')
dist = (const.au).to(u.m).value # distance between the earth and the sun in
print('La distancia entre la tierra y el sol es:',dist,'m')

#APARTADO B
L=(const.L_sun).to(u.W).value
Teff = (L/(4*np.pi*dist**2*const.sigma_sb)).value**0.25     # effective temp
print('La temperatura efectiva del sol es:',Teff,'K')

#APARTADO C
(1*u.pc).to(u.km)
print('La distancia en kilómetros de un parsec es:',(1*u.pc).to(u.km))
```

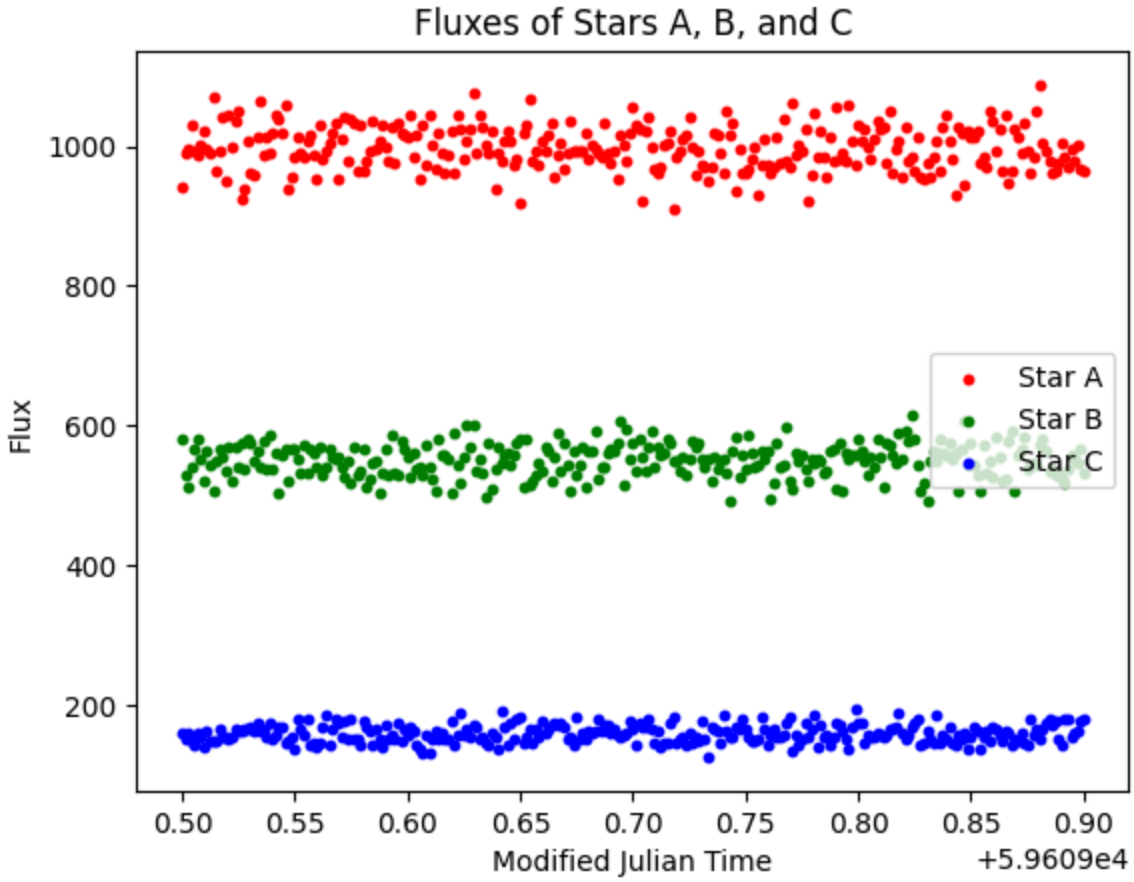
```
La masa del sol es: 1.988409870698051e+30 kg
El radio del sol es: 695700000.0 m
La masa de la tierra es: 5.972167867791379e+24 kg
El radio de la tierra es: 6378100.0 m
La distancia entre la tierra y el sol es: 149597870700.0 m
La temperatura efectiva del sol es: 393.61793270879895 K
La distancia en kilómetros de un parsec es: 30856775814913.67 km
```

In [ ]:
```
from astropy import constants as const
from astropy import units as u
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt

# PROBLEMA 2
# Apartado A
# we are going to plot the light curve of 3 diferent stars
# the data is in teh file: Fluxes.cvs
# the file has 4 colums: time in Julian days, intensity of a star A, intensi

#Load the data
data =pd.read_csv("Fluxes.csv",skiprows=3, header=None, names = ["JulianDay"
print(data.columns)

# Apartado 2
# Transform julian time to modified julian time
data["MJD"] = data ["JulianDay"] - 2400000.5
print(data)

# Apartado 3
```

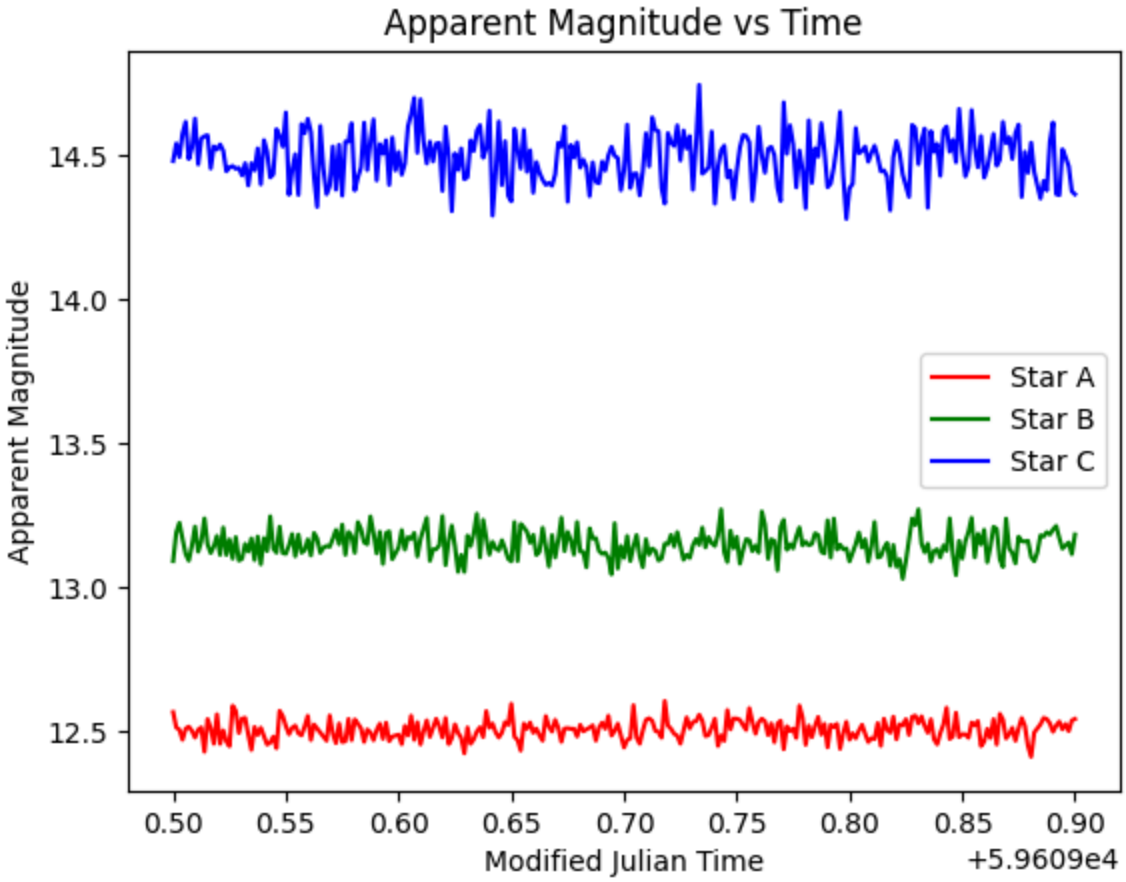
```
# Represent the fluxes of stars A, B and C in modified julian time.
# Use a diferent colour for each star, points not lines and add a leyend, na

plt.scatter(data["MJD"], data["A"], color='red', marker='o', linestyle='None
plt.scatter(data["MJD"], data["B"], color='green', marker='o', linestyle='No
plt.scatter(data["MJD"], data["C"], color='blue', marker='o', linestyle='Nor

plt.xlabel('Modified Julian Time')
plt.ylabel('Flux')
plt.title('Fluxes of Stars A, B, and C')
plt.legend()

plt.show()

# Apartado 4
# calculate the mean flux of each star and the standard deviation of the flu
mean_A = data["A"].mean()
std_A = data["A"].std()
print("El flujo medio de la estrella A es: ", mean_A, "y la desviación estar

mean_B = data["B"].mean()
std_B = data["B"].std()
print("El flujo medio de la estrella B es: ", mean_B, "y la desviación estar

mean_C = data["C"].mean()
std_C = data["C"].std()
print("El flujo medio de la estrella C es: ", mean_C, "y la desviación estar
# which star has the most precise measurements?
if std_A < std_B and std_A < std_C:
    print("La estrella medida con mayor precisión es la A")
elif std_B < std_A and std_B < std_C:
    print("La estrella medida con mayor precisión es la B")
else:
    print("La estrella medida con mayor precisión es la C")

# Apartado 5
# Calculate the variation coefficient of the fluxes of each star
variation_A = std_A/mean_A
variation_B = std_B/mean_B
variation_C = std_C/mean_C
print("El coeficiente de variación de la estrella A es: ", variation_A,"el c
# Which star has the most precise measurements?
if variation_A < variation_B and variation_A < variation_C:
    print("La estrella medida con mayor precisión es la A")
elif variation_B < variation_A and variation_B < variation_C:
    print("La estrella medida con mayor precisión es la B")
else:
    print("La estrella medida con mayor precisión es la C")

# Apartado 6
# calculate the aparent magnitude of each star using as calibration constant
C = 20
data["mag_A"] = C - 2.5*np.log10(data["A"])
data["mag_B"] = C - 2.5*np.log10(data["B"])
data["mag_C"] = C - 2.5*np.log10(data["C"])
```

```
print(data)

# represent the data
plt.plot(data["MJD"], data["mag_A"], color='red', label='Star A')
plt.plot(data["MJD"], data["mag_B"], color='green', label='Star B')
plt.plot(data["MJD"], data["mag_C"], color='blue', label='Star C')

plt.xlabel('Modified Julian Time')
plt.ylabel('Apparent Magnitude')
plt.title('Apparent Magnitude vs Time')
plt.legend()

plt.show()

# Apartado 7
# calculate the mean, standard deviation and variation coefficient of the ap
mean_mag_A = data["mag_A"].mean()
std_mag_A = data["mag_A"].std()
variation_mag_A = std_mag_A/mean_mag_A
print("La magnitud aparente media de la estrella A es: ", mean_mag_A, "la de

mean_mag_B = data["mag_B"].mean()
std_mag_B = data["mag_B"].std()
variation_mag_B = std_mag_B/mean_mag_B
print("La magnitud aparente media de la estrella B es: ", mean_mag_B, "la de

mean_mag_C = data["mag_C"].mean()
std_mag_C = data["mag_C"].std()
variation_mag_C = std_mag_C/mean_mag_C
print("La magnitud aparente media de la estrella C es: ", mean_mag_C, "la de

# Which star has the most precise measurements?
if variation_mag_A < variation_mag_B and variation_mag_A < variation_mag_C:
    print("La estrella medida con mayor precisión es la A")
elif variation_mag_B < variation_mag_A and variation_mag_B < variation_mag_C
    print("La estrella medida con mayor precisión es la B")
else:
    print("La estrella medida con mayor precisión es la C")
```

```
Index(['JulianDay', 'A', 'B', 'C'], dtype='object')
        JulianDay        A       B       C          MJD
0    2.459610e+06   942.40  580.70  161.10  59609.50000
1    2.459610e+06   990.09  529.97  152.30  59609.50139
2    2.459610e+06   996.98  513.72  159.08  59609.50278
3    2.459610e+06  1029.76  541.13  147.55  59609.50417
4    2.459610e+06   993.91  567.58  142.03  59609.50556
..            ...      ...     ...     ...          ...
284  2.459610e+06   995.97  557.90  155.13  59609.89444
285  2.459610e+06   979.00  552.73  159.08  59609.89583
286  2.459610e+06  1001.55  547.19  163.75  59609.89722
287  2.459610e+06   967.96  568.06  177.53  59609.89861
288  2.459610e+06   963.44  533.31  179.21  59609.90000

[289 rows x 5 columns]
```



```
El flujo medio de la estrella A es:  997.6436678200693 y la desviación estan
dar es:  31.769755419534647
El flujo medio de la estrella B es:  550.6358823529413 y la desviación estan
dar es:  23.670715190692675
El flujo medio de la estrella C es:  159.95435986159168 y la desviación esta
ndar es:  12.762846456633627
La estrella medida con mayor precisión es la C
El coeficiente de variación de la estrella A es:  0.031844792328461415 el de
la estrella B es:  0.0429879634606167 y el de la estrella C es:  0.079790550
67756391
La estrella medida con mayor precisión es la A
        JulianDay        A       B       C          MJD      mag_A      mag_
B  \
0    2.459610e+06   942.40  580.70  161.10  59609.50000  12.564412  13.09012
0
1    2.459610e+06   990.09  529.97  152.30  59609.50139  12.510813  13.18937
2
2    2.459610e+06   996.98  513.72  159.08  59609.50278  12.503284  13.22318
4
3    2.459610e+06  1029.76  541.13  147.55  59609.50417  12.468160  13.16674
6
4    2.459610e+06   993.91  567.58  142.03  59609.50556  12.506632  13.11493
2
..            ...      ...     ...     ...          ...        ...
...
284  2.459610e+06   995.97  557.90  155.13  59609.89444  12.504384  13.13360
9
285  2.459610e+06   979.00  552.73  159.08  59609.89583  12.523043  13.14371
7
286  2.459610e+06  1001.55  547.19  163.75  59609.89722  12.498318  13.15465
5
287  2.459610e+06   967.96  568.06  177.53  59609.89861  12.535356  13.11401
4
288  2.459610e+06   963.44  533.31  179.21  59609.90000  12.540438  13.18255
1

         mag_C
0    14.482261
1    14.543250
2    14.495961
3    14.577652
4    14.619050
..         ...
284  14.523261
285  14.495961
286  14.464547
287  14.376821
288  14.366594

[289 rows x 8 columns]
```




```
La magnitud aparente media de la estrella A es:  12.503110772070531 la desvi
ación estandar es:  0.03461585819828097 y el coeficiente de variación es:
0.0027685796622394106
La magnitud aparente media de la estrella B es:  13.148844414627014 la desvi
ación estandar es:  0.04689014766079016 y el coeficiente de variación es:
0.0035661040759314717
La magnitud aparente media de la estrella C es:  14.493445109454045 la desvi
ación estandar es:  0.08651003332243574 y el coeficiente de variación es:
0.00596890750743627
La estrella medida con mayor precisión es la A
```

In [ ]:

```python
# PROBLEMA 3
# APARTADO A
import astropy.io.fits as fits
import numpy as np
import matplotlib.pyplot as plt
import pandas as pd

# Abre el archivo FITS
hdulist = fits.open('ZetaPersei_Spectrum.fits')
hdulist.info()
# Imprime las columnas de datos
print(hdulist[0].header)
print(hdulist[1].columns)

# APARTADO B
wave = hdulist[1].data['WAVE']
flux = hdulist[1].data['FLUX']
```

```
# APARTADO C
flux_norm = flux/np.max(flux)
plt.scatter(wave,flux_norm, s=2)
plt.xlabel("Wavelength (Angstrom)")
plt.ylabel("Normalized Flux")
plt.title("Normalized Spectrum of Zeta Persei")
plt.show()

# APAARTADO D
H_alpha = 6563
H_beta = 4861
plt.scatter(wave,flux_norm, s=2)
plt.axvline(H_alpha, color='g')
plt.axvline(H_beta, color='g')
plt.xlabel("Wavelength (Angstrom)")
plt.ylabel("Normalized Flux")
plt.title("Normalized Spectrum of Zeta Persei")
plt.show()

# APARTADO E
plt.scatter(wave,flux_norm, s=2)
plt.xlabel("Wavelength (Angstrom)")
plt.ylabel("Normalized Flux")
plt.title("Normalized Spectrum of Zeta Persei")
plt.axvline(4713, color='r')
plt.axvline(4921, color='r')
plt.axvline(5016, color='r')
plt.axvline(5047, color='r')
plt.axvline(5876, color='r')
plt.axvline(6678, color='r')
plt.show()

# APARTDAO F
plt.scatter(wave,flux_norm, s=2)
plt.xlabel("Wavelength (Angstrom)")
plt.ylabel("Normalized Flux")
plt.title("Normalized Spectrum of Zeta Persei")
plt.xlim(5870,5900)
plt.axvline(4713, color='r')
plt.axvline(4921, color='r')
plt.axvline(5016, color='r')
plt.axvline(5047, color='r')
plt.axvline(5876, color='r')
plt.axvline(5890, color='b')
plt.axvline(5896, color='b')
plt.axvline(6678, color='r')
plt.show()

# APARTADO G
# La diferencia en la anchura de las líneas entre la primera y la segunda gr
# que se forman a distinta temperatura. Las líneas del helio son más estrech
# a temperaturas más altas que las del sodio.

# APARTADO H
w_rest = 588.995
c
```

```
v = c*((5890-w_rest)/w_rest)
print("La velocidad radial de la estrella es:",v.to(u.km/u.s))
```

```
Filename: ZetaPersei_Spectrum.fits
No.    Name      Ver    Type      Cards   Dimensions   Format
  0  PRIMARY       1 PrimaryHDU     788   ()
  1  SPECTRUM      1 BinTableHDU     71   1R x 6C   [134944D, 134944E, 13494
4E, 134944E, 134944E, 134944E]
```

```
SIMPLE  =                    T / file does conform to FITS standard
BITPIX  =                    8 / number of bits per data pixel
NAXIS   =                    0 / number of data axes
EXTEND  =                    T / FITS dataset may contain extensions
COMMENT FITS (Flexible Image Transport System) format is defined in 'Astrono
my  COMMENT and Astrophysics', volume 376, page 359; bibcode: 2001A&A...37
6..359H   DATE    = '2014-10-27T17:37:40' / file creation date (YYYY-MM-DDTh
h:mm:ss UT)   TELESCOP= 'ESO-VLT-U2'         / ESO Telescope Name
INSTRUME= 'UVES    '           / Instrument used.
RA      =            58.532869 / 03:54:07.8 RA (J2000) pointing
DEC     =             31.88341 / 31:53:00.2 DEC (J2000) pointing
EQUINOX =                2000. / Standard FK5
RADECSYS= 'FK5     '           / Coordinate reference frame
MJD-OBS =      56923.349084405 / MJD start (2014-09-23T08:22:40.893)
DATE-OBS= '2014-09-23T08:22:40.892' / Date of observation
UTC     =               30156. / 08:22:36.000 UTC at start
LST     =            13765.018 / 03:49:25.018 LST at start
PI-COI  = 'UNKNOWN '           / PI-COI name.
OBSERVER= 'UNKNOWN '           / Name of observer.
ARCFILE = 'ADP.2014-10-29T09:42:08.747.fits' / Archive File Name
PIPEFILE= 'r.UVES.2014-09-23T08:22:40.893_0011.fits' / no comment
EXPTIME =               2.4998 / Total integration time
ORIGIN  = 'ESO     '           / European Southern Observatory.
PRODLVL =                    2 / Product level: 1-raw 2-science grade 3-adva
ncedDISPELEM= 'CD#3    '
SPECSYS = 'TOPOCENT'
OBJECT  = 'HD24398 '           / Original target.
TEXPTIME=               2.4998 / [s] Total integration time of all exposures
EXT_OBJ =                    F / Extended object
MJD-END =    56923.34911333787 / MJD of the last of the stop times
PROG_ID = '194.C-0833(A)'
OBID1   =              1137109 / Observation block ID
M_EPOCH =                    F / T if resulting from multiple epochs
PROV1   = 'UVES.2014-09-23T08:22:40.893.fits'
PROCSOFT= 'uves/5.4.0'
OBSTECH = 'ECHELLE '
PRODCATG= 'SCIENCE.SPECTRUM'
FLUXCAL = 'ABSOLUTE'
CONTNORM=                    F / T if normalised to the continuum
WAVELMIN=            458.2899 / [nm] Minimum wavelength
WAVELMAX=            668.6722 / [nm] Maximum wavelength
SPEC_BIN=              0.0014 / [nm] Wavelength bin size
SPEC_ERR=                 0.0
SPEC_SYE=                   2
TOT_FLUX=                    F / T if photom. cond. and all src flux capture
d   FLUXERR =                  -2 / Uncertainty in flux scale (%)
NCOMBINE=                    1 / # of combined raw science data files
REFERENC= '        '
SNR     =            213.8633 / Median signal to noise ratio per order
SPEC_RES=            107200.0 / Reference spectral resolving power
DETRON  =                 4.0 / Readout noise per output (e-)
HIERARCH ESO OBS AIRM = 2. / Req. max. airmass
HIERARCH ESO OBS AMBI FWHM = 2. / Req. max. seeing
HIERARCH ESO OBS AMBI TRANS = '4THK    ' / Req. sky transparency
HIERARCH ESO OBS ATM = 'NATM    ' / Req. Atmospheric Turbulence Model
HIERARCH ESO OBS CONTAINER ID = 1137108 / Scheduling container ID
```

```
HIERARCH ESO OBS CONTAINER TYPE = 'G       ' / Scheduling container type
HIERARCH ESO OBS DID = 'ESO-VLT-DIC.OBS-1.12' / OBS Dictionary
HIERARCH ESO OBS EXECTIME = 1575 / Expected execution time
HIERARCH ESO OBS GRP = '0       ' / linked blocks
HIERARCH ESO OBS ID =  1137109 / Observation block ID
HIERARCH ESO OBS MOON DIST = 30 / Req. min. angular dist. from moon
HIERARCH ESO OBS MOON FLI = 1. / Req. max. fractional lunar illum.
HIERARCH ESO OBS NAME = 'HD24398_dic1_1' / OB name
HIERARCH ESO OBS OBSERVER = 'UNKNOWN ' / Observer Name
HIERARCH ESO OBS PI-COI ID = 11857 / ESO internal PI-COI ID
HIERARCH ESO OBS PI-COI NAME = 'UNKNOWN ' / PI-COI name
HIERARCH ESO OBS PROG ID = '194.C-0833(A)' / ESO program identification
HIERARCH ESO OBS STREHLRATIO = 0. / Req. strehl ratio
HIERARCH ESO OBS TARG NAME = 'HD24398 ' / OB target name
HIERARCH ESO OBS TWILIGHT =  0 / Req. twilight
HIERARCH ESO OBS WATERVAPOUR = 0. / Req. water vapour
HIERARCH ESO OBS START = '2014-09-23T08:12:58' / OB start time
HIERARCH ESO OBS NTPL =      2 / Number of templates within OB
HIERARCH ESO OBS TPLNO =     2 / Template number within OB
HIERARCH ESO TPL DID = 'ESO-VLT-DIC.TPL-1.9' / Data dictionary for TPL
HIERARCH ESO TPL ID = 'UVES_dic1_obs_exp' / Template signature ID
HIERARCH ESO TPL NAME = 'Dic1 Observation' / Template name
HIERARCH ESO TPL PRESEQ = 'UVES_dic_obs.seq' / Sequencer script
HIERARCH ESO TPL START = '2014-09-23T08:18:34' / TPL start time
HIERARCH ESO TPL VERSION = '@(#) $Revision: 163655 $' / Version of the templ
HIERARCH ESO TPL NEXP =     53 / Number of exposures within templat
HIERARCH ESO TPL EXPNO =     7 / Exposure number within template
HIERARCH ESO TEL DID = 'ESO-VLT-DIC.TCS' / Data dictionary for TEL
HIERARCH ESO TEL ID = 'v 254420' / TCS version number
HIERARCH ESO TEL DATE = '2000-01-01T00:00:00' / TCS installation date
HIERARCH ESO TEL ALT = 33.452 / Alt angle at start
HIERARCH ESO TEL AZ = 181.441 / Az angle at start S=0,W=90
HIERARCH ESO TEL GEOELEV = 2648. / Elevation above sea level (m)
HIERARCH ESO TEL GEOLAT = -24.6272 / Tel geo latitute (+=North)
HIERARCH ESO TEL GEOLON = -70.4048 / Tel geo longitude (+=East)
HIERARCH ESO TEL OPER = 'I, Condor' / Telescope Operator
HIERARCH ESO TEL FOCU ID = 'NB      ' / Telescope focus station ID
HIERARCH ESO TEL FOCU LEN = 120. / Focal length
HIERARCH ESO TEL FOCU SCALE = 1.718 / Focal scale
HIERARCH ESO TEL FOCU VALUE = -28.772 / M2 setting
HIERARCH ESO TEL PARANG START = -178.455 / Parallactic angle at start
HIERARCH ESO TEL AIRM START = 1.81 / Airmass at start
HIERARCH ESO TEL AMBI FWHM START = 0.88 / Observatory Seeing queried from AS
HIERARCH ESO TEL AMBI PRES START = 743.2 / Observatory ambient air pressure
q   HIERARCH ESO TEL AMBI WINDSP = 9.8 / Observatory ambient wind speed que
HIERARCH ESO TEL AMBI WINDDIR = 3. / Observatory ambient wind direction
HIERARCH ESO TEL AMBI RHUM = 15. / Observatory ambient relative humid
HIERARCH ESO TEL AMBI TEMP = 6.85 / Observatory ambient temperature qu
HIERARCH ESO TEL MOON RA = 170.67448 / 11:22:41.8 RA (J2000)
HIERARCH ESO TEL MOON DEC = 1.92161 / 01:55:17.7 DEC (J2000)
HIERARCH ESO TEL TH M1 TEMP = 7.03 / M1 superficial temperature
HIERARCH ESO TEL TRAK STATUS = 'NORMAL  ' / Tracking status
HIERARCH ESO TEL DOME STATUS = 'FULLY-OPEN' / Dome status
HIERARCH ESO TEL CHOP ST =   F / True when chopping is active
HIERARCH ESO TEL TARG ALPHA = 35407.92 / Alpha coordinate for the target
HIERARCH ESO TEL TARG DELTA = 315301.1 / Delta coordinate for the target
```

```
HIERARCH ESO TEL TARG EPOCH = 2000. / Epoch
HIERARCH ESO TEL TARG EPOCHSYSTEM = 'J       ' / Epoch system (default J=Jul
ian)HIERARCH ESO TEL TARG EQUINOX = 2000. / Equinox
HIERARCH ESO TEL TARG PMA = 0.00577 / Proper Motion Alpha
HIERARCH ESO TEL TARG PMD = -0.00992 / Proper motion Delta
HIERARCH ESO TEL TARG RADVEL = 0. / Radial velocity
HIERARCH ESO TEL TARG PARALLAX = 0. / Parallax
HIERARCH ESO TEL TARG COORDTYPE = 'M       ' / Coordinate type (M=mean A=app
arenHIERARCH ESO TEL PARANG END = -178.51 / Parallactic angle at end
HIERARCH ESO TEL AIRM END = 1.81 / Airmass at end
HIERARCH ESO TEL AMBI FWHM END = 0.88 / Observatory Seeing queried from AS
HIERARCH ESO TEL IA FWHM = 1.15 / Delivered seeing corrected by airm
HIERARCH ESO TEL IA FWHMLIN = 1.51 / Delivered seeing on IA detector (l
HIERARCH ESO TEL IA FWHMLINOBS = 2.16 / Delivered seeing on IA detector (l
HIERARCH ESO TEL AMBI PRES END = 743.2 / Observatory ambient air pressure q
HIERARCH ESO TEL AMBI TAU0 = 0.0015 / Average coherence time
HIERARCH ESO INS ID = 'UVES/$Revision: 250420 $' / Instrument ID.
HIERARCH ESO INS DID = 'ESO-VLT-DIC.UVES_ICS-215796' / Data dictionary f
HIERARCH ESO INS SWSIM = 'NORMAL  ' / Software simulation.
HIERARCH ESO INS PATH = 'RED     ' / Optical path used.
HIERARCH ESO INS ADC MODE = 'OFF     ' / ADC mode.
HIERARCH ESO INS DPOL MODE = 'OFF     ' / Instrument depolarizer mode.
HIERARCH ESO INS MODE = 'DICHR#1 ' / Instrument mode used.
HIERARCH ESO INS SHUT1 ID = 'TSH     ' / Shutter ID.
HIERARCH ESO INS SHUT1 NAME = 'Tel_Shutter' / Shutter name.
HIERARCH ESO INS SHUT1 ST =  T / Shutter open.
HIERARCH ESO INS MIRR1 ID = 'FREE    ' / Mirror unique ID.
HIERARCH ESO INS MIRR1 NAME = 'FREE    ' / Mirror common name.
HIERARCH ESO INS MIRR1 NO =  1 / Mirror slide position.
HIERARCH ESO INS SHUT3 ID = 'TSH3    ' / Shutter ID.
HIERARCH ESO INS SHUT3 NAME = 'D2L_Shutter' / Shutter name.
HIERARCH ESO INS SHUT3 ST =  F / Shutter open.
HIERARCH ESO INS SHUT4 ID = 'TSH4    ' / Shutter ID.
HIERARCH ESO INS SHUT4 NAME = 'ThAr_Shutter' / Shutter name.
HIERARCH ESO INS SHUT4 ST =  F / Shutter open.
HIERARCH ESO INS SLIT3 WID = 0.3 / Slit width [arcsec].
HIERARCH ESO INS SLIT3 Y1FRML= 'ENC=OFFSET+RESOL*acos((WID-(MAX+MIN))/(MAX-M
IN)'HIERARCH ESO INS SLIT3 Y1OFFSET = 4750 / Left ref. position [Enc].
HIERARCH ESO INS SLIT3 Y1RESOL = 40. / Left encoder resolution [Enc/deg].
HIERARCH ESO INS SLIT3 Y1WIDMAX = 5.572 / Left max. slit width value [arcsec
HIERARCH ESO INS SLIT3 Y1WIDMIN = 0.062 / Left min. slit width value [arcsec
HIERARCH ESO INS SLIT3 Y2FRML= 'ENC=OFFSET+RESOL*acos((WID-(MAX+MIN))/(MAX-M
IN)'HIERARCH ESO INS SLIT3 Y2OFFSET = 4560 / Right ref. position [Enc].
HIERARCH ESO INS SLIT3 Y2RESOL = 40. / Right encoder resolution [Enc/deg]
HIERARCH ESO INS SLIT3 Y2WIDMAX = 5.513 / Right max. slit width value [arcse
HIERARCH ESO INS SLIT3 Y2WIDMIN = 0.05 / Right min. slit width value [arcse
HIERARCH ESO INS SLIT3 Y1ENC = 11369 / Slit Vertical top motor absolute e
HIERARCH ESO INS SLIT3 Y2ENC = 11138 / Slit Vertical bottom motor absolut
HIERARCH ESO INS LAMP7 SWSIM = T / If T, function is software simulat
HIERARCH ESO INS SLIT3 LEN = 11. / Slit length [arcsec].
HIERARCH ESO INS SLIT3 X1FRML= 'ENC=OFFSET+RESOL*acos((LEN-(MAX+MIN))/(MAX-M
IN)'HIERARCH ESO INS SLIT3 X1OFFSET = 2381 / Left ref. position [Enc].
HIERARCH ESO INS SLIT3 X1RESOL = 40. / Left encoder resolution [Enc/deg].
HIERARCH ESO INS SLIT3 X1LENMAX = 15.752 / Left max. slit length [arcsec].
HIERARCH ESO INS SLIT3 X1LENMIN = 0.087 / Left min. slit length [arcsec].
HIERARCH ESO INS SLIT3 X2FRML= 'ENC=OFFSET+RESOL*acos((LEN-(MAX+MIN))/(MAX-M
```

IN)'HIERARCH ESO INS SLIT3 X2OFFSET = 2307 / Right ref. position [Enc].
HIERARCH ESO INS SLIT3 X2RESOL = 40. / Right encoder resolution [Enc/deg]
HIERARCH ESO INS SLIT3 X2LENMAX = 15.833 / Right max. slit length [arcsec].
HIERARCH ESO INS SLIT3 X2LENMIN = 0.064 / Right min. slit length [arcsec].
HIERARCH ESO INS SLIT3 X1ENC = 6701 / Slit Horizontal left motor absolut
HIERARCH ESO INS SLIT3 X2ENC = 6631 / Slit Horizontal right motor absolu
HIERARCH ESO INS FILT3 ID = 'BS4   ' / Filter unique id.
HIERARCH ESO INS FILT3 NAME = 'SHP700 ' / Filter common name.
HIERARCH ESO INS FILT3 NO = 4 / Filter wheel position index.
HIERARCH ESO INS DET6 NAME = 'Red_ExpMeter' / Exposure meter name.
HIERARCH ESO INS DET6 CTMIN = 459253. / Minimum count during exposure.
HIERARCH ESO INS DET6 CTMAX = 525641. / Maximum count during exposure.
HIERARCH ESO INS DET6 CTTOT = 5382500. / Total counts during exposure.
HIERARCH ESO INS DET6 CTMEAN = 489318.2 / Average counts during exposure.
HIERARCH ESO INS DET6 CTRMS = 20501.77 / RMS of counts during exposure.
HIERARCH ESO INS DET6 TMMEAN = 0.5 / Normalised mean exposure time.
HIERARCH ESO INS DET6 UIT = 1. / User defined Integration time [sec
HIERARCH ESO INS DET6 OFFDRK = 0. / Average dark background counts.
HIERARCH ESO INS DET6 OFFSKY = 1. / Average sky background counts.
HIERARCH ESO INS SHUT6 ID = 'REXS   ' / Shutter ID.
HIERARCH ESO INS SHUT6 NAME = 'Red_ExpMeterSh' / Shutter name.
HIERARCH ESO INS SHUT6 ST = T / Shutter open.
HIERARCH ESO INS SHUT2 ID = 'SPSH   ' / Shutter ID.
HIERARCH ESO INS SHUT2 NAME = 'Sphere_Shutter' / Shutter name.
HIERARCH ESO INS SHUT2 ST = F / Shutter open.
HIERARCH ESO INS GRAT2 ID = 'CD#3   ' / Grating unique ID.
HIERARCH ESO INS GRAT2 NAME = 'CD#3   ' / Grating common name.
HIERARCH ESO INS GRAT2 FRML = 'ENC=Z+R*asin(WL*OR*GRV/(2*cos(ROT)))+TR*(T-T
0)' HIERARCH ESO INS GRAT2 ZORDER = 4446366 / Grating zero order position
[Enc].   HIERARCH ESO INS GRAT2 RESOL = 22500. / Resolution in encoder step
s.   HIERARCH ESO INS GRAT2 GROOVES = 0.0006 / Grating grooves / nm
[gr/nm].   HIERARCH ESO INS GRAT2 ROT = 22.668 / Grating rot angle [de
g].   HIERARCH ESO INS GRAT2 TEMPRAMP = 26.25 / Temperature s
lope [Enc/C].   HIERARCH ESO INS GRAT2 TEMPREF = 12.4 / Temperature
reference value.   HIERARCH ESO INS PIXSCALE = 0.182 / Pixel scale
[arcsec].   HIERARCH ESO INS GRAT2 X = 2048. / X pixel f
or central wavelength.   HIERARCH ESO INS GRAT2 Y = 2048. / Y pix
el for central wavelength.   HIERARCH ESO INS GRAT2 NO = 1 / Gra
ting wheel position index.   HIERARCH ESO INS GRAT2 WLEN = 56
4. / Grating central wavelength [nm].   HIERARCH ESO INS GRAT2 ENC =
4684007 / Grating absolute encoder position.   HIERARCH ESO INS OPTI1 ID
= '1   ' / General Optical device unique ID.   HIERARCH ESO INS OPTI1
NAME = 'OUT   ' / General Optical device common name   HIERARCH ESO INS OP
TI1 NO = 1 / Slot number.   HIERARCH ESO IN
S OPTI1 TYPE = 'FREE   ' / General Optical device Element.   HIERARCH ES
O INS TILT2 POS = 0. / Science camera tilt [pix].   HIERARC
H ESO INS TILT2 FRML = 'ENC=OFFSET+RESOL*asin(2*POS-(MAX+MIN)/(MAX-MIN)' HIE
RARCH ESO INS TILT2 OFFSET = 15876. / Offset in Formula.
HIERARCH ESO INS TILT2 RESOL = -100. / Resolution in encoder steps.
HIERARCH ESO INS TILT2 POSMIN = -222. / Minimum camera tilt [pix].
HIERARCH ESO INS TILT2 POSMAX = 222. / Maximum camera tilt [pix].
HIERARCH ESO INS TILT2 TEMP = 9. / Temperature used to position the c
HIERARCH ESO INS TILT2 ENC = 15896 / Camera tilt absolute encoder posit
HIERARCH ESO INS SHUT7 ID = 'FPSH   ' / Shutter ID.
HIERARCH ESO INS SHUT7 NAME = 'FibrProjShutter' / Shutter name.
HIERARCH ESO INS SHUT7 ST = F / Shutter open.

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HIERARCH ESO INS TEMP1 ID = 'TMBC    ' / Temperature sensor ID.
HIERARCH ESO INS TEMP1 NAME = 'Temp. blue camera' / Temperature sensor name.
HIERARCH ESO INS TEMP1 VAL = 9.3 / Temperature sensor numeric value [
HIERARCH ESO INS TEMP1 MIN = 9.3 / Minimum temperature [C].
HIERARCH ESO INS TEMP1 MAX = 9.3 / Maximum temperature [C].
HIERARCH ESO INS TEMP1 MEAN = 9.3 / Average temperature [C].
HIERARCH ESO INS TEMP1 RMS = 0. / RMS of samples over exposure.
HIERARCH ESO INS TEMP2 ID = 'TMRC    ' / Temperature sensor ID.
HIERARCH ESO INS TEMP2 NAME = 'Temp. red camera' / Temperature sensor name.
HIERARCH ESO INS TEMP2 VAL = 9. / Temperature sensor numeric value [
HIERARCH ESO INS TEMP2 MIN = 9. / Minimum temperature [C].
HIERARCH ESO INS TEMP2 MAX = 9. / Maximum temperature [C].
HIERARCH ESO INS TEMP2 MEAN = 9. / Average temperature [C].
HIERARCH ESO INS TEMP2 RMS = 0. / RMS of samples over exposure.
HIERARCH ESO INS TEMP3 ID = 'TMT     ' / Temperature sensor ID.
HIERARCH ESO INS TEMP3 NAME = 'Temp. table' / Temperature sensor name.
HIERARCH ESO INS TEMP3 VAL = 10.2 / Temperature sensor numeric value [
HIERARCH ESO INS TEMP3 MIN = 10.2 / Minimum temperature [C].
HIERARCH ESO INS TEMP3 MAX = 10.2 / Maximum temperature [C].
HIERARCH ESO INS TEMP3 MEAN = 10.2 / Average temperature [C].
HIERARCH ESO INS TEMP3 RMS = 0. / RMS of samples over exposure.
HIERARCH ESO INS TEMP4 ID = 'TMIA    ' / Temperature sensor ID.
HIERARCH ESO INS TEMP4 NAME = 'Temp. inside air' / Temperature sensor name.
HIERARCH ESO INS TEMP4 VAL = 9.9 / Temperature sensor numeric value [
HIERARCH ESO INS TEMP4 MIN = 10. / Minimum temperature [C].
HIERARCH ESO INS TEMP4 MAX = 10. / Maximum temperature [C].
HIERARCH ESO INS TEMP4 MEAN = 10. / Average temperature [C].
HIERARCH ESO INS TEMP4 RMS = 0. / RMS of samples over exposure.
HIERARCH ESO INS SENS26 ID = 'BARO    ' / sensor ID.
HIERARCH ESO INS SENS26 NAME = 'Barometer pressure' / sensor common name.
HIERARCH ESO INS SENS26 VAL = 742.3 / Sensor numeric value.
HIERARCH ESO INS SENS26 MIN = 742.3 / Minimum sensor value.
HIERARCH ESO INS SENS26 MAX = 742.3 / Maximum sensor value.
HIERARCH ESO INS SENS26 MEAN = 742.3 / Average sensor value.
HIERARCH ESO INS SENS26 RMS = 0. / RMS of samples over exposure.
HIERARCH ESO INS SLIT1 NAME = 'FREE    ' / Slit common name.
HIERARCH ESO INS SLIT1 NO =  1 / Slide position.
HIERARCH ESO INS SLIT1 WID = 0. / Slit width [arcsec].
HIERARCH ESO INS SLIT1 LEN = 0. / Slit length [arcsec].
HIERARCH ESO INS DROT MODE = 'ELEV    ' / Instrument derotator mode.
HIERARCH ESO INS DROT RA = 35407.888485 / ~~:~~:~~.~ RA (J2000) pointing [de
HIERARCH ESO INS DROT DEC = 315300.271776 / ~~:~~:~~.~ DEC (J2000) pointing
[   HIERARCH ESO INS DROT POSANG = 0. / Position angle [deg].
HIERARCH ESO INS DROT BEGIN = 343.2615 / Physical position at start [deg].
HIERARCH ESO INS DROT END = 343.261 / Physical position at end [deg].
HIERARCH ESO INS SHUT8 ST =  F / Shutter open.
HIERARCH ESO INS SHUT9 ST =  F / Shutter open.
HIERARCH ESO INS SHUT10 ST = F / Shutter open.
HIERARCH ESO INS DPOS NAME = 'OUT     ' / Instrument depolarizer slide posit
HIERARCH ESO INS DPOS NO =   1 / Depolarizer slide position.
HIERARCH ESO INS DPOR ST =   F / Instrument depolarizer rotating.
HIERARCH ESO INS ADCS NAME = 'OUT     ' / ADC slide position.
HIERARCH ESO INS ADCS NO =   1 / ADC slide position.
HIERARCH ESO INS ADC1 MODE = 'OFF     ' / ADC mode.
HIERARCH ESO INS ADC1 RA = 35407.888485 / ~~:~~:~~.~ RA (J2000) pointing [de
HIERARCH ESO INS ADC1 DEC = 315300.271776 / ~~:~~:~~.~ DEC (J2000) pointing
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[   HIERARCH ESO INS ADC1 BEGIN = 359.834 / Position angle at start [deg].
HIERARCH ESO INS ADC1 END = 359.834 / Position angle at end [deg].
HIERARCH ESO INS ADC2 MODE = 'OFF     ' / ADC mode.
HIERARCH ESO INS ADC2 RA = 35407.888485 / ~~:~~:~~.~ RA (J2000) pointing [de
HIERARCH ESO INS ADC2 DEC = 315300.271776 / ~~:~~:~~.~ DEC (J2000) pointing
[   HIERARCH ESO INS ADC2 BEGIN = 101.497 / Position angle at start [deg].
HIERARCH ESO INS ADC2 END = 101.497 / Position angle at end [deg].
HIERARCH ESO INS FILT1 ID = 'FREE    ' / Filter unique id.
HIERARCH ESO INS FILT1 NAME = 'FREE    ' / Filter common name.
HIERARCH ESO INS FILT1 NO = 13 / Filter wheel position index.
HIERARCH ESO INS OPTI2 ID = 'Diaphr.27mm' / General Optical device unique I
D.   HIERARCH ESO INS OPTI2 NAME = 'OVRSIZ  ' / General Optical device commo
n name   HIERARCH ESO INS OPTI2 NO =  3 / Slot number.
HIERARCH ESO INS OPTI2 TYPE = 'SLIDE   ' / General Optical device Element.
HIERARCH ESO INS MIRR2 ID = 'DICHR#1 ' / Mirror unique ID.
HIERARCH ESO INS MIRR2 NAME = 'DICHR#1 ' / Mirror common name.
HIERARCH ESO INS MIRR2 NO =  3 / Mirror slide position.
HIERARCH ESO INS SENSOR5 SWSIM = T / If T, function is software simulat
HIERARCH ESO INS TEMP31 ID = 'IODT    ' / Temperature sensor ID.
HIERARCH ESO INS TEMP31 NAME = 'Iodine cell temp.' / Temperature sensor nam
e.   HIERARCH ESO INS TEMP31 VAL = 9.9 / Temperature sensor numeric value [
HIERARCH ESO INS TEMP31 MIN = 10. / Minimum temperature [C].
HIERARCH ESO INS TEMP31 MAX = 10. / Maximum temperature [C].
HIERARCH ESO INS TEMP31 MEAN = 10. / Average temperature [C].
HIERARCH ESO INS TEMP31 RMS = 0. / RMS of samples over exposure.
HIERARCH ESO DET ID = 'CCD FIERA - Rev: 238334' / Detector system Id
HIERARCH ESO DET NAME = 'ccdUvR - ccdUvr' / Name of detector system
HIERARCH ESO DET DATE = '1998-07-09' / Installation date
HIERARCH ESO DET DID = 'ESO-VLT-DIC.CCDDCS,ESO-VLT-DIC.FCDDCS' / Diction
HIERARCH ESO DET BITS =     16 / Bits per pixel readout
HIERARCH ESO DET RA = 58.532868674 / Apparent 03:54:07.8 RA at start
HIERARCH ESO DET DEC = 31.883408823 / Apparent 31:53:00.2 DEC at start
HIERARCH ESO DET CHIPS =     2 / # of chips in detector array
HIERARCH ESO DET CHIP2 OUTPUTS = 2 / # of outputs
HIERARCH ESO DET CHIP2 OUTREF = 0 / reference output
HIERARCH ESO DET WINDOWS =   1 / # of windows readout
HIERARCH ESO DET SOFW MODE = 'Normal  ' / CCD sw operational mode
HIERARCH ESO DET EXP NO = 28211 / Unique exposure ID number
HIERARCH ESO DET EXP TYPE = 'Normal  ' / Exposure type
HIERARCH ESO DET EXP RDTTIME = 39.465 / image readout time
HIERARCH ESO DET EXP XFERTIM = 39.424 / image transfer time
HIERARCH ESO DET WIN1 ST =   T / If T, window enabled
HIERARCH ESO DET WIN1 STRX = 1 / Lower left pixel in X
HIERARCH ESO DET WIN1 STRY = 1 / Lower left pixel in Y
HIERARCH ESO DET WIN1 NX = 4296 / # of pixels along X
HIERARCH ESO DET WIN1 NY = 4096 / # of pixels along Y
HIERARCH ESO DET WIN1 BINX = 1 / Binning factor along X
HIERARCH ESO DET WIN1 BINY = 1 / Binning factor along Y
HIERARCH ESO DET WIN1 NDIT = 1 / # of subintegrations
HIERARCH ESO DET WIN1 UIT1 = 2.5 / user defined subintegration time
HIERARCH ESO DET WIN1 DIT1 = 2.499787 / actual subintegration time
HIERARCH ESO DET WIN1 DKTM = 3.1797 / Dark current time
HIERARCH ESO DET READ MODE = 'normal  ' / Readout method
HIERARCH ESO DET READ SPEED = '2pts/225kHz/lg' / Readout speed
HIERARCH ESO DET READ CLOCK = '225kHz/2ports/low_gain' / Readout clock patte
rn   HIERARCH ESO DET READ NFRAM = 1 / Number of readouts buffered in sin
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HIERARCH ESO DET FRAM ID =   1 / Image sequencial number
HIERARCH ESO DET FRAM TYPE = 'Normal  ' / Type of frame
HIERARCH ESO DET SHUT TYPE = 'Slit    ' / type of shutter
HIERARCH ESO DET SHUT ID = 'ccdUvr shutter' / Shutter unique identifier
HIERARCH ESO DET SHUT TMOPEN = 0.042 / Time taken to open shutter
HIERARCH ESO DET SHUT TMCLOS = 0.041 / Time taken to close shutter
HIERARCH ESO DET TELE INT = 60. / Interval between two successive te
HIERARCH ESO DET TELE NO =   3 / # of sources active
HIERARCH ESO DET TLM1 NAME = 'CCD T1  ' / Description of telemetry param.
HIERARCH ESO DET TLM1 ID = 'CCD Sensor1' / ID of telemetry sensor
HIERARCH ESO DET TLM1 START = 135. / Telemetry value at read start
HIERARCH ESO DET TLM1 END = 135. / Telemetry value at read completion
HIERARCH ESO DET TLM2 NAME = 'CCD T2  ' / Description of telemetry param.
HIERARCH ESO DET TLM2 ID = 'CCD Sensor2' / ID of telemetry sensor
HIERARCH ESO DET TLM2 START = 137.2 / Telemetry value at read start
HIERARCH ESO DET TLM2 END = 137.2 / Telemetry value at read completion
HIERARCH ESO DET TLM3 NAME = 'EBOX T  ' / Description of telemetry param.
HIERARCH ESO DET TLM3 ID = 'Box Temp' / ID of telemetry sensor
HIERARCH ESO DET TLM3 START = 286.9 / Telemetry value at read start
HIERARCH ESO DET TLM3 END = 286.9 / Telemetry value at read completion
HIERARCH ESO DET CHIP2 INDEX = 2 / Chip index
HIERARCH ESO DET CHIP2 ID = 'CCD-44  ' / Detector chip identification
HIERARCH ESO DET CHIP2 NAME = 'MIT/LL, EEV' / Detector chip name
HIERARCH ESO DET CHIP2 DATE = '1998-07-09' / Date of installation [YYYY-MM-D
D]  HIERARCH ESO DET CHIP2 X =   2 / X location in array
HIERARCH ESO DET CHIP2 Y =   1 / Y location in array
HIERARCH ESO DET CHIP2 NX = 2048 / # of pixels along X
HIERARCH ESO DET CHIP2 NY = 4096 / # of pixels along Y
HIERARCH ESO DET CHIP2 PSZX = 15. / Size of pixel in X
HIERARCH ESO DET CHIP2 PSZY = 15. / Size of pixel in Y
HIERARCH ESO DET CHIP2 XGAP = 0. / Gap between chips along x
HIERARCH ESO DET CHIP2 YGAP = 0. / Gap between chips along y
HIERARCH ESO DET CHIP2 OUT1 INDEX = 2 / Output index
HIERARCH ESO DET CHIP2 OUT1 ID = 'R       ' / Output ID as from manufacturer
HIERARCH ESO DET CHIP2 OUT1 NAME = 'R       ' / Description of output
HIERARCH ESO DET CHIP2 OUT1 CHIP = 2 / Chip to which the output belongs
HIERARCH ESO DET CHIP2 OUT1 X = 4096 / X location of output
HIERARCH ESO DET CHIP2 OUT1 Y = 1 / Y location of output
HIERARCH ESO DET CHIP2 OUT1 NX = 2048 / valid pixels along X
HIERARCH ESO DET CHIP2 OUT1 NY = 4096 / valid pixels along Y
HIERARCH ESO DET CHIP2 OUT1 CONAD = 1.47 / Conversion from ADUs to electrons
HIERARCH ESO DET CHIP2 OUT1 RON = 4.0 / [e-] Readout noise per output (ele
HIERARCH ESO DET CHIP2 OUT1 GAIN = 0.68 / Conversion from electrons to ADU
HIERARCH ESO PRO CHIP2 ANCESTOR = 'UVES.2014-09-23T08:22:40.893.fits'
HIERARCH ESO PRO CHIP2 DID = 'PRO-1.15' / Data dictionary for PRO
HIERARCH ESO PRO CHIP2 CATG = 'FLUXCAL_SCI_POINT_REDL' / Category of pipelin
e prHIERARCH ESO PRO CHIP2 TYPE = 'REDUCED ' / Product type
HIERARCH ESO PRO CHIP2 TECH = 'ECHELLE ' / Observation technique
HIERARCH ESO PRO CHIP2 SCIENCE = T / Scientific product if T
HIERARCH ESO PRO R1C2 ID = 'uves_obs_scired' / Pipeline recipe (unique) iden
tifiHIERARCH ESO PRO R1C2 DRS ID = 'cpl-6.5 ' / Data Reduction System identi
fier    HIERARCH ESO PRO R1C2 PIPE ID = 'uves/5.4.0' / Pipeline (unique) ide
ntifier     HIERARCH ESO PRO R1C2 RAW1 NAME = 'UVES.2014-09-23T08:22:40.893.
fits' / File namHIERARCH ESO PRO R1C2 RAW1 CATG = 'SCI_POINT_RED' / Category
of raw frame       HIERARCH ESO PRO CHIP2 DATANCOM = 1 / Number of combined
frames                  HIERARCH ESO PRO R1C2 CAL1 NAME = 'UV_GEXT_031013A_ex
```

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tcoeff_table.fits' / File nHIERARCH ESO PRO R1C2 CAL1 CATG = 'EXTCOEFF_TABL
E' / Category of calibration fraHIERARCH ESO PRO R1C2 CAL1 DATAMD5 = '8b6806
a8b8ce62e0c4514763ce4be125' / MD5 siHIERARCH ESO PRO R1C2 CAL2 NAME = 'UV_PO
RD_140922A_REDL564d1_1x1.fits' / File naHIERARCH ESO PRO R1C2 CAL2 CATG = 'O
RDER_TABLE_REDL' / Category of calibration fHIERARCH ESO PRO R1C2 CAL2 DATAM
D5 = '31ab31a2531c554f8a11c8e3cf8129a2' / MD5 siHIERARCH ESO PRO R1C2 CAL3 N
AME = 'UV_PLIN_140922A_REDL564d1_1x1_03.fits' / FileHIERARCH ESO PRO R1C2 CA
L3 CATG = 'LINE_TABLE_REDL' / Category of calibration frHIERARCH ESO PRO R1C
2 CAL3 DATAMD5 = '151526fef2c5a49765d173d511b9d882' / MD5 siHIERARCH ESO PRO
R1C2 CAL4 NAME = 'UV_MBIA_140922A_REDL_1x1.fits' / File name ofHIERARCH ESO
PRO R1C2 CAL4 CATG = 'MASTER_BIAS_REDL' / Category of calibration fHIERARCH
ESO PRO R1C2 CAL4 DATAMD5 = '7a7879b14592e0fa0de2e484fbb682ec' / MD5 siHIERA
RCH ESO PRO R1C2 CAL5 NAME = 'UV_MFLT_140922A_REDL564d1_1x1_03.fits' / FileH
IERARCH ESO PRO R1C2 CAL5 CATG = 'MASTER_FLAT_REDL' / Category of calibratio
n fHIERARCH ESO PRO R1C2 CAL5 DATAMD5 = '2ad87e84fe03cde96d99dd52adb62747' /
MD5 siHIERARCH ESO PRO R1C2 CAL6 NAME = 'UV_GMRE_040927A_master_response_RED
L564.fits'HIERARCH ESO PRO R1C2 CAL6 CATG = 'MASTER_RESPONSE_REDL' / Categor
y of calibratiHIERARCH ESO PRO R1C2 CAL7 NAME = 'UV_PORD_140922A_REDU564d1_1
x1.fits' / File naHIERARCH ESO PRO R1C2 CAL7 CATG = 'ORDER_TABLE_REDU' / Cat
egory of calibration fHIERARCH ESO PRO R1C2 CAL7 DATAMD5 = '3da2bde651c6e53f
e8c5f51ddb788670' / MD5 siHIERARCH ESO PRO R1C2 CAL8 NAME = 'UV_PLIN_140922A
_REDU564d1_1x1_03.fits' / FileHIERARCH ESO PRO R1C2 CAL8 CATG = 'LINE_TABLE_
REDU' / Category of calibration frHIERARCH ESO PRO R1C2 CAL8 DATAMD5 = 'be4d
7c5c43b7bee4d34cda9a7448271f' / MD5 siHIERARCH ESO PRO R1C2 CAL9 NAME = 'UV_
MBIA_140922A_REDU_1x1.fits' / File name ofHIERARCH ESO PRO R1C2 CAL9 CATG =
'MASTER_BIAS_REDU' / Category of calibration fHIERARCH ESO PRO R1C2 CAL9 DAT
AMD5 = 'ab6297b72e0a607dcb3d8f892d98457d' / MD5 siHIERARCH ESO PRO R1C2 CAL1
0 NAME = 'UV_MFLT_140922A_REDU564d1_1x1_03.fits' / FilHIERARCH ESO PRO R1C2
CAL10 CATG = 'MASTER_FLAT_REDU' / Category of calibration HIERARCH ESO PRO R
1C2 CAL10 DATAMD5 = '8cec409b19f057237225f4e970ace5fd' / MD5 sHIERARCH ESO P
RO R1C2 CAL11 NAME= 'UV_GMRE_040927A_master_response_REDU564.fits'HIERARCH E
SO PRO R1C2 CAL11 CATG = 'MASTER_RESPONSE_REDU' / Category of calibratHIERAR
CH ESO PRO R1C2 PARAM1 NAME = 'debug   ' / Whether or not to save intermedHI
ERARCH ESO PRO R1C2 PARAM1 VALUE = 'false   ' / Default: false
HIERARCH ESO PRO R1C2 PARAM2 NAME = 'plotter ' / Any plots produced by the r
ecipHIERARCH ESO PRO R1C2 PARAM2 VALUE = 'no      ' / Default: 'no'
HIERARCH ESO PRO R1C2 PARAM3 NAME = 'process_chip' / For RED arm data proces
s thHIERARCH ESO PRO R1C2 PARAM3 VALUE = 'BOTH    ' / Default: 'both'
HIERARCH ESO PRO R1C2 PARAM4 NAME = 'clean_traps' / Clean detector traps. If
TRUHIERARCH ESO PRO R1C2 PARAM4 VALUE = 'false   ' / Default: false
HIERARCH ESO PRO R1C2 PARAM5 NAME = 'reduce.backsub.mmethod' / Background me
asurHIERARCH ESO PRO R1C2 PARAM5 VALUE = 'median  ' / Default: 'median'
HIERARCH ESO PRO R1C2 PARAM6 NAME = 'reduce.backsub.npoints' / This is the n
umbeHIERARCH ESO PRO R1C2 PARAM6 VALUE = '82      ' / Default: 82
HIERARCH ESO PRO R1C2 PARAM7 NAME = 'reduce.backsub.radiusy' / The height (i
n piHIERARCH ESO PRO R1C2 PARAM7 VALUE = '2       ' / Default: 2
HIERARCH ESO PRO R1C2 PARAM8 NAME = 'reduce.backsub.sdegree' / Degree of int
erpoHIERARCH ESO PRO R1C2 PARAM8 VALUE = '1       ' / Default: 1
HIERARCH ESO PRO R1C2 PARAM9 NAME = 'reduce.backsub.smoothx' / If spline int
erpoHIERARCH ESO PRO R1C2 PARAM9 VALUE = '-1      ' / Default: -1
HIERARCH ESO PRO R1C2 PARAM10 NAME = 'reduce.backsub.smoothy' / If spline in
terpHIERARCH ESO PRO R1C2 PARAM10 VALUE = '-1      ' / Default: -1
HIERARCH ESO PRO R1C2 PARAM11 NAME = 'reduce.extract.method' / Extraction me
thodHIERARCH ESO PRO R1C2 PARAM11 VALUE = 'optimal ' / Default: 'optimal'
HIERARCH ESO PRO R1C2 PARAM12 NAME = 'reduce.extract.kappa' / In optimal ext
ractHIERARCH ESO PRO R1C2 PARAM12 VALUE = '10      ' / Default: 10
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HIERARCH ESO PRO R1C2 PARAM13 NAME = 'reduce.extract.chunk' / In optimal ext
ractHIERARCH ESO PRO R1C2 PARAM13 VALUE = '32      ' / Default: 32
HIERARCH ESO PRO R1C2 PARAM14 NAME = 'reduce.extract.profile' / In optimal e
xtraHIERARCH ESO PRO R1C2 PARAM14 VALUE = 'auto    ' / Default: 'auto'
HIERARCH ESO PRO R1C2 PARAM15 NAME = 'reduce.extract.skymethod' / In optimal
extHIERARCH ESO PRO R1C2 PARAM15 VALUE = 'optimal ' / Default: 'optimal'
HIERARCH ESO PRO R1C2 PARAM16 NAME = 'reduce.extract.oversample' / The overs
amplHIERARCH ESO PRO R1C2 PARAM16 VALUE = '-1      ' / Default: -1
HIERARCH ESO PRO R1C2 PARAM17 NAME = 'reduce.extract.best' / (optimal extrac
tionHIERARCH ESO PRO R1C2 PARAM17 VALUE = 'true    ' / Default: true
HIERARCH ESO PRO R1C2 PARAM18 NAME = 'reduce.slitlength' / Extraction slit l
engtHIERARCH ESO PRO R1C2 PARAM18 VALUE = '-1      ' / Default: -1
HIERARCH ESO PRO R1C2 PARAM19 NAME = 'reduce.skysub' / Do sky-subtraction (o
nly HIERARCH ESO PRO R1C2 PARAM19 VALUE = 'true    ' / Default: true
HIERARCH ESO PRO R1C2 PARAM20 NAME = 'reduce.objoffset' / Offset (in pixels)
of HIERARCH ESO PRO R1C2 PARAM20 VALUE = '0       ' / Default: 0
HIERARCH ESO PRO R1C2 PARAM21 NAME = 'reduce.objslit' / Object window size
(in pHIERARCH ESO PRO R1C2 PARAM21 VALUE = '-1      ' / Default: -1
HIERARCH ESO PRO R1C2 PARAM22 NAME = 'reduce.tiltcorr' / If enabled (recomme
ndedHIERARCH ESO PRO R1C2 PARAM22 VALUE = 'true    ' / Default: true
HIERARCH ESO PRO R1C2 PARAM23 NAME = 'reduce.ffmethod' / Flat-fielding metho
d. IHIERARCH ESO PRO R1C2 PARAM23 VALUE = 'extract ' / Default: 'extract'
HIERARCH ESO PRO R1C2 PARAM24 NAME = 'reduce.rebin.wavestep' / The bin size
(in HIERARCH ESO PRO R1C2 PARAM24 VALUE = '-1      ' / Default: -1
HIERARCH ESO PRO R1C2 PARAM25 NAME = 'reduce.rebin.scale' / Whether or not t
o muHIERARCH ESO PRO R1C2 PARAM25 VALUE = 'false   ' / Default: false
HIERARCH ESO PRO R1C2 PARAM26 NAME = 'reduce.merge' / Order merging method.
If 'HIERARCH ESO PRO R1C2 PARAM26 VALUE = 'optimal ' / Default: 'optimal'
HIERARCH ESO PRO R1C2 PARAM27 NAME = 'reduce.merge_delt1' / Order merging le
ft hHIERARCH ESO PRO R1C2 PARAM27 VALUE = '0       ' / Default: 0
HIERARCH ESO PRO R1C2 PARAM28 NAME = 'reduce.merge_delt2' / Order merging ri
ght HIERARCH ESO PRO R1C2 PARAM28 VALUE = '0       ' / Default: 0
HIERARCH ESO PRO R1C2 START = '2014-10-27T18:36:38'
HIERARCH ESO PRO R1C2 STOP = '2014-10-27T18:37:40'
HIERARCH ESO ADA ABSROT START = -34.93689 / Abs rot angle at exp start
HIERARCH ESO ADA POSANG = 0. / Position angle at start
HIERARCH ESO ADA GUID STATUS = 'ON      ' / Status of autoguider
HIERARCH ESO ADA GUID RA = 58.382399 / 03:53:31.7 Guide star RA J2000
HIERARCH ESO ADA GUID DEC = 31.84088 / 31:50:27.1 Guide star DEC J2000
HIERARCH ESO ADA ABSROT PPOS = 'POS     ' / sign of probe position
HIERARCH ESO ADA ABSROT END = -34.88789 / Abs rot angle at exp end
HIERARCH ESO OCS SIMCAL =    0 / Simultaneous Calibration flag
HIERARCH ESO QC DID = 'UVES-1.14' / ESO QC DID
HIERARCH ESO QC TEST1 ID = 'Science-Reduction-Test-Results' / Name of QC tes
t   HIERARCH ESO QC CHIP2 ORD1 OBJ SN = 132.3676 / Av. S/N at order center
HIERARCH ESO QC CHIP2 ORD1 OBJ POS = 25.7418 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP2 ORD1 OBJ FWHM = 8.2117 / Av. FWHM on order
HIERARCH ESO QC CHIP2 ORD1 OBJ RPLPAR = -1.0 / Av. relative ripple amplitude
HIERARCH ESO QC CHIP2 ORD2 OBJ SN = 181.5196 / Av. S/N at order center
HIERARCH ESO QC CHIP2 ORD2 OBJ POS = 25.5856 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP2 ORD2 OBJ FWHM = 8.187799999999999 / Av. FWHM on order
HIERARCH ESO QC CHIP2 ORD2 OBJ RPLPAR = -1.0 / Av. relative ripple amplitude
HIERARCH ESO QC CHIP2 ORD3 OBJ SN = 191.0475 / Av. S/N at order center
HIERARCH ESO QC CHIP2 ORD3 OBJ POS = 25.4328 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP2 ORD3 OBJ FWHM = 8.202 / Av. FWHM on order
HIERARCH ESO QC CHIP2 ORD3 OBJ RPLPAR = 0.8403 / Av. relative ripple amplitu
```

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de  HIERARCH ESO QC CHIP2 ORD4 OBJ SN = 200.8231 / Av. S/N at order center
HIERARCH ESO QC CHIP2 ORD4 OBJ POS = 25.2841 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP2 ORD4 OBJ FWHM = 8.2293 / Av. FWHM on order
HIERARCH ESO QC CHIP2 ORD4 OBJ RPLPAR = 0.7301 / Av. relative ripple amplitu
de  HIERARCH ESO QC CHIP2 ORD5 OBJ SN = 205.3409 / Av. S/N at order center
HIERARCH ESO QC CHIP2 ORD5 OBJ POS = 25.1392 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP2 ORD5 OBJ FWHM = 8.206300000000001 / Av. FWHM on order
HIERARCH ESO QC CHIP2 ORD5 OBJ RPLPAR = 0.7161 / Av. relative ripple amplitu
de  HIERARCH ESO QC CHIP2 ORD6 OBJ SN = 208.3667 / Av. S/N at order center
HIERARCH ESO QC CHIP2 ORD6 OBJ POS = 24.9973 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP2 ORD6 OBJ FWHM = 8.2073 / Av. FWHM on order
HIERARCH ESO QC CHIP2 ORD6 OBJ RPLPAR = 0.7534 / Av. relative ripple amplitu
de  HIERARCH ESO QC CHIP2 ORD7 OBJ SN = 208.2978 / Av. S/N at order center
HIERARCH ESO QC CHIP2 ORD7 OBJ POS = 24.8573 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP2 ORD7 OBJ FWHM = 8.1792 / Av. FWHM on order
HIERARCH ESO QC CHIP2 ORD7 OBJ RPLPAR = 0.9809 / Av. relative ripple amplitu
de  HIERARCH ESO QC CHIP2 ORD8 OBJ SN = 206.4019 / Av. S/N at order center
HIERARCH ESO QC CHIP2 ORD8 OBJ POS = 24.7183 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP2 ORD8 OBJ FWHM = 8.151300000000001 / Av. FWHM on order
HIERARCH ESO QC CHIP2 ORD8 OBJ RPLPAR = 0.7802 / Av. relative ripple amplitu
de  HIERARCH ESO QC CHIP2 ORD9 OBJ SN = 200.2641 / Av. S/N at order center
HIERARCH ESO QC CHIP2 ORD9 OBJ POS = 24.5793 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP2 ORD9 OBJ FWHM = 8.1129 / Av. FWHM on order
HIERARCH ESO QC CHIP2 ORD9 OBJ RPLPAR = 1.0388 / Av. relative ripple amplitu
de  HIERARCH ESO QC CHIP2 ORD10 OBJ SN = 207.2073 / Av. S/N at order center
HIERARCH ESO QC CHIP2 ORD10 OBJ POS = 24.4399 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP2 ORD10 OBJ FWHM = 8.083600000000001 / Av. FWHM on order
HIERARCH ESO QC CHIP2 ORD10 OBJ RPLPAR = 0.7199 / Av. relative ripple amplit
ude HIERARCH ESO QC CHIP2 ORD11 OBJ SN = 207.1184 / Av. S/N at order center
HIERARCH ESO QC CHIP2 ORD11 OBJ POS = 24.2997 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP2 ORD11 OBJ FWHM = 8.0199 / Av. FWHM on order
HIERARCH ESO QC CHIP2 ORD11 OBJ RPLPAR = 0.9966 / Av. relative ripple amplit
ude HIERARCH ESO QC CHIP2 ORD12 OBJ SN = 210.444 / Av. S/N at order center
HIERARCH ESO QC CHIP2 ORD12 OBJ POS = 24.1591 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP2 ORD12 OBJ FWHM = 7.9772 / Av. FWHM on order
HIERARCH ESO QC CHIP2 ORD12 OBJ RPLPAR = 0.8162 / Av. relative ripple amplit
ude HIERARCH ESO QC CHIP2 ORD13 OBJ SN = 218.5779 / Av. S/N at order center
HIERARCH ESO QC CHIP2 ORD13 OBJ POS = 24.0187 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP2 ORD13 OBJ FWHM = 7.9084 / Av. FWHM on order
HIERARCH ESO QC CHIP2 ORD13 OBJ RPLPAR = 0.65 / Av. relative ripple amplitud
e   HIERARCH ESO QC CHIP2 ORD14 OBJ SN = 219.203 / Av. S/N at order center
HIERARCH ESO QC CHIP2 ORD14 OBJ POS = 23.8795 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP2 ORD14 OBJ FWHM = 7.8424 / Av. FWHM on order
HIERARCH ESO QC CHIP2 ORD14 OBJ RPLPAR = 0.6724 / Av. relative ripple amplit
ude HIERARCH ESO QC CHIP2 ORD15 OBJ SN = 217.0662 / Av. S/N at order center
HIERARCH ESO QC CHIP2 ORD15 OBJ POS = 23.7426 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP2 ORD15 OBJ FWHM = 7.7781 / Av. FWHM on order
HIERARCH ESO QC CHIP2 ORD15 OBJ RPLPAR = 0.6577 / Av. relative ripple amplit
ude HIERARCH ESO QC CHIP2 ORD16 OBJ SN = 214.2397 / Av. S/N at order center
HIERARCH ESO QC CHIP2 ORD16 OBJ POS = 23.6092 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP2 ORD16 OBJ FWHM = 7.6923 / Av. FWHM on order
HIERARCH ESO QC CHIP2 ORD16 OBJ RPLPAR = 0.6449 / Av. relative ripple amplit
ude HIERARCH ESO QC CHIP2 ORD17 OBJ SN = 214.2112 / Av. S/N at order center
HIERARCH ESO QC CHIP2 ORD17 OBJ POS = 23.4804 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP2 ORD17 OBJ FWHM = 7.617 / Av. FWHM on order
HIERARCH ESO QC CHIP2 ORD17 OBJ RPLPAR = 0.633 / Av. relative ripple amplitu
```

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de  HIERARCH ESO QC CHIP2 ORD18 OBJ SN = 215.4925 / Av. S/N at order center
HIERARCH ESO QC CHIP2 ORD18 OBJ POS = 23.3565 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP2 ORD18 OBJ FWHM = 7.5328 / Av. FWHM on order
HIERARCH ESO QC CHIP2 ORD18 OBJ RPLPAR = 0.6314 / Av. relative ripple amplit
ude HIERARCH ESO QC CHIP2 ORD19 OBJ SN = 218.1621 / Av. S/N at order center
HIERARCH ESO QC CHIP2 ORD19 OBJ POS = 23.2373 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP2 ORD19 OBJ FWHM = 7.4567 / Av. FWHM on order
HIERARCH ESO QC CHIP2 ORD19 OBJ RPLPAR = 0.6492 / Av. relative ripple amplit
ude HIERARCH ESO QC CHIP2 ORD20 OBJ SN = 220.5967 / Av. S/N at order center
HIERARCH ESO QC CHIP2 ORD20 OBJ POS = 23.1214 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP2 ORD20 OBJ FWHM = 7.3741 / Av. FWHM on order
HIERARCH ESO QC CHIP2 ORD20 OBJ RPLPAR = 0.6372 / Av. relative ripple amplit
ude HIERARCH ESO QC CHIP2 ORD21 OBJ SN = 220.9654 / Av. S/N at order center
HIERARCH ESO QC CHIP2 ORD21 OBJ POS = 23.0055 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP2 ORD21 OBJ FWHM = 7.3071 / Av. FWHM on order
HIERARCH ESO QC CHIP2 ORD21 OBJ RPLPAR = 0.6584 / Av. relative ripple amplit
ude HIERARCH ESO QC CHIP2 ORD22 OBJ SN = 223.7675 / Av. S/N at order center
HIERARCH ESO QC CHIP2 ORD22 OBJ POS = 22.8846 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP2 ORD22 OBJ FWHM = 7.2198 / Av. FWHM on order
HIERARCH ESO QC CHIP2 ORD22 OBJ RPLPAR = 0.6556 / Av. relative ripple amplit
ude HIERARCH ESO QC CHIP2 ORD23 OBJ SN = 224.5802 / Av. S/N at order center
HIERARCH ESO QC CHIP2 ORD23 OBJ POS = 22.7509 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP2 ORD23 OBJ FWHM = 7.1493 / Av. FWHM on order
HIERARCH ESO QC CHIP2 ORD23 OBJ RPLPAR = 0.6428 / Av. relative ripple amplit
ude HIERARCH ESO QC CHIP2 ORD24 OBJ SN = 155.2222 / Av. S/N at order center
HIERARCH ESO QC CHIP2 ORD24 OBJ POS = 22.5932 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP2 ORD24 OBJ FWHM = 7.112 / Av. FWHM on order
HIERARCH ESO QC CHIP2 ORD24 OBJ RPLPAR = -1.0 / Av. relative ripple amplitud
e   HIERARCH ESO QC CHIP2 EX NORD = 24 / No. of orders extracted
HIERARCH ESO QC EX XSIZE = 4096 / Input image width (pixels)
HIERARCH ESO QC EX YSIZE =  58 / Extraction slit (pixels)
HIERARCH ESO QC VRAD BARYCOR = 25.710936 / Barycentric radial velocity corre
ctioHIERARCH ESO QC VRAD HELICOR = 25.700554 / Heliocentric radial velocity
correctiHIERARCH ESO DET CHIP1 OUTPUTS = 2 / # of outputs
HIERARCH ESO DET CHIP1 OUTREF = 0 / reference output
HIERARCH ESO DET CHIP1 INDEX = 1 / Chip index
HIERARCH ESO DET CHIP1 ID = 'CCD-20  ' / Detector chip identification
HIERARCH ESO DET CHIP1 NAME = 'MIT/LL, EEV' / Detector chip name
HIERARCH ESO DET CHIP1 DATE = '1998-07-09' / Date of installation [YYYY-MM-D
D]  HIERARCH ESO DET CHIP1 X =   1 / X location in array
HIERARCH ESO DET CHIP1 Y =   1 / Y location in array
HIERARCH ESO DET CHIP1 NX = 2048 / # of pixels along X
HIERARCH ESO DET CHIP1 NY = 4096 / # of pixels along Y
HIERARCH ESO DET CHIP1 PSZX = 15.0 / Size of pixel in X
HIERARCH ESO DET CHIP1 PSZY = 15.0 / Size of pixel in Y
HIERARCH ESO DET CHIP1 XGAP = 0.0 / Gap between chips along x
HIERARCH ESO DET CHIP1 YGAP = 0.0 / Gap between chips along y
HIERARCH ESO DET CHIP1 OUT1 INDEX = 1 / Output index
HIERARCH ESO DET CHIP1 OUT1 ID = 'L       ' / Output ID as from manufacturer
HIERARCH ESO DET CHIP1 OUT1 NAME = 'L       ' / Description of output
HIERARCH ESO DET CHIP1 OUT1 CHIP = 1 / Chip to which the output belongs
HIERARCH ESO DET CHIP1 OUT1 X = 1 / X location of output
HIERARCH ESO DET CHIP1 OUT1 Y = 1 / Y location of output
HIERARCH ESO DET CHIP1 OUT1 NX = 2048 / valid pixels along X
HIERARCH ESO DET CHIP1 OUT1 NY = 4096 / valid pixels along Y
HIERARCH ESO DET CHIP1 OUT1 CONAD = 1.41 / Conversion from ADUs to electrons
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HIERARCH ESO DET CHIP1 OUT1 RON = 4.0 / [e-] Readout noise per output (ele
HIERARCH ESO DET CHIP1 OUT1 GAIN = 0.71 / Conversion from electrons to ADU
HIERARCH ESO PRO CHIP1 ANCESTOR = 'UVES.2014-09-23T08:22:40.893.fits'
HIERARCH ESO PRO CHIP1 DID = 'PRO-1.15' / Data dictionary for PRO
HIERARCH ESO PRO CHIP1 CATG = 'FLUXCAL_SCI_POINT_REDU' / Category of pipelin
e prHIERARCH ESO PRO CHIP1 TYPE = 'REDUCED ' / Product type
HIERARCH ESO PRO CHIP1 TECH = 'ECHELLE ' / Observation technique
HIERARCH ESO PRO CHIP1 SCIENCE = T / Scientific product if T
HIERARCH ESO PRO R1C1 ID = 'uves_obs_scired' / Pipeline recipe (unique) iden
tifiHIERARCH ESO PRO R1C1 DRS ID = 'cpl-6.5 ' / Data Reduction System identi
fier    HIERARCH ESO PRO R1C1 PIPE ID = 'uves/5.4.0' / Pipeline (unique) ide
ntifier     HIERARCH ESO PRO R1C1 RAW1 NAME = 'UVES.2014-09-23T08:22:40.893.
fits' / File namHIERARCH ESO PRO R1C1 RAW1 CATG = 'SCI_POINT_RED' / Category
of raw frame       HIERARCH ESO PRO CHIP1 DATANCOM = 1 / Number of combined
frames                 HIERARCH ESO PRO R1C1 CAL1 NAME = 'UV_GEXT_031013A_ex
tcoeff_table.fits' / File nHIERARCH ESO PRO R1C1 CAL1 CATG = 'EXTCOEFF_TABL
E' / Category of calibration fraHIERARCH ESO PRO R1C1 CAL1 DATAMD5 = '8b6806
a8b8ce62e0c4514763ce4be125' / MD5 siHIERARCH ESO PRO R1C1 CAL2 NAME = 'UV_PO
RD_140922A_REDL564d1_1x1.fits' / File naHIERARCH ESO PRO R1C1 CAL2 CATG = 'O
RDER_TABLE_REDL' / Category of calibration fHIERARCH ESO PRO R1C1 CAL2 DATAM
D5 = '31ab31a2531c554f8a11c8e3cf8129a2' / MD5 siHIERARCH ESO PRO R1C1 CAL3 N
AME = 'UV_PLIN_140922A_REDL564d1_1x1_03.fits' / FileHIERARCH ESO PRO R1C1 CA
L3 CATG = 'LINE_TABLE_REDL' / Category of calibration frHIERARCH ESO PRO R1C
1 CAL3 DATAMD5 = '151526fef2c5a49765d173d511b9d882' / MD5 siHIERARCH ESO PRO
R1C1 CAL4 NAME = 'UV_MBIA_140922A_REDL_1x1.fits' / File name ofHIERARCH ESO
PRO R1C1 CAL4 CATG = 'MASTER_BIAS_REDL' / Category of calibration fHIERARCH
ESO PRO R1C1 CAL4 DATAMD5 = '7a7879b14592e0fa0de2e484fbb682ec' / MD5 siHIERA
RCH ESO PRO R1C1 CAL5 NAME = 'UV_MFLT_140922A_REDL564d1_1x1_03.fits' / FileH
IERARCH ESO PRO R1C1 CAL5 CATG = 'MASTER_FLAT_REDL' / Category of calibratio
n fHIERARCH ESO PRO R1C1 CAL5 DATAMD5 = '2ad87e84fe03cde96d99dd52adb62747' /
MD5 siHIERARCH ESO PRO R1C1 CAL6 NAME = 'UV_GMRE_040927A_master_response_RED
L564.fits'HIERARCH ESO PRO R1C1 CAL6 CATG = 'MASTER_RESPONSE_REDL' / Categor
y of calibratiHIERARCH ESO PRO R1C1 CAL7 NAME = 'UV_PORD_140922A_REDU564d1_1
x1.fits' / File naHIERARCH ESO PRO R1C1 CAL7 CATG = 'ORDER_TABLE_REDU' / Cat
egory of calibration fHIERARCH ESO PRO R1C1 CAL7 DATAMD5 = '3da2bde651c6e53f
e8c5f51ddb788670' / MD5 siHIERARCH ESO PRO R1C1 CAL8 NAME = 'UV_PLIN_140922A
_REDU564d1_1x1_03.fits' / FileHIERARCH ESO PRO R1C1 CAL8 CATG = 'LINE_TABLE_
REDU' / Category of calibration frHIERARCH ESO PRO R1C1 CAL8 DATAMD5 = 'be4d
7c5c43b7bee4d34cda9a7448271f' / MD5 siHIERARCH ESO PRO R1C1 CAL9 NAME = 'UV_
MBIA_140922A_REDU_1x1.fits' / File name ofHIERARCH ESO PRO R1C1 CAL9 CATG =
'MASTER_BIAS_REDU' / Category of calibration fHIERARCH ESO PRO R1C1 CAL9 DAT
AMD5 = 'ab6297b72e0a607dcb3d8f892d98457d' / MD5 siHIERARCH ESO PRO R1C1 CAL1
0 NAME = 'UV_MFLT_140922A_REDU564d1_1x1_03.fits' / FilHIERARCH ESO PRO R1C1
CAL10 CATG = 'MASTER_FLAT_REDU' / Category of calibration HIERARCH ESO PRO R
1C1 CAL10 DATAMD5 = '8cec409b19f057237225f4e970ace5fd' / MD5 sHIERARCH ESO P
RO R1C1 CAL11 NAME= 'UV_GMRE_040927A_master_response_REDU564.fits'HIERARCH E
SO PRO R1C1 CAL11 CATG = 'MASTER_RESPONSE_REDU' / Category of calibratHIERAR
CH ESO PRO R1C1 PARAM1 NAME = 'debug   ' / Whether or not to save intermedHI
ERARCH ESO PRO R1C1 PARAM1 VALUE = 'false   ' / Default: false
HIERARCH ESO PRO R1C1 PARAM2 NAME = 'plotter ' / Any plots produced by the r
ecipHIERARCH ESO PRO R1C1 PARAM2 VALUE = 'no      ' / Default: 'no'
HIERARCH ESO PRO R1C1 PARAM3 NAME = 'process_chip' / For RED arm data proces
s thHIERARCH ESO PRO R1C1 PARAM3 VALUE = 'BOTH    ' / Default: 'both'
HIERARCH ESO PRO R1C1 PARAM4 NAME = 'clean_traps' / Clean detector traps. If
TRUHIERARCH ESO PRO R1C1 PARAM4 VALUE = 'false   ' / Default: false
HIERARCH ESO PRO R1C1 PARAM5 NAME = 'reduce.backsub.mmethod' / Background me
```

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asurHIERARCH ESO PRO R1C1 PARAM5 VALUE = 'median  ' / Default: 'median'
HIERARCH ESO PRO R1C1 PARAM6 NAME = 'reduce.backsub.npoints' / This is the n
umbeHIERARCH ESO PRO R1C1 PARAM6 VALUE = '82      ' / Default: 82
HIERARCH ESO PRO R1C1 PARAM7 NAME = 'reduce.backsub.radiusy' / The height (i
n piHIERARCH ESO PRO R1C1 PARAM7 VALUE = '2       ' / Default: 2
HIERARCH ESO PRO R1C1 PARAM8 NAME = 'reduce.backsub.sdegree' / Degree of int
erpoHIERARCH ESO PRO R1C1 PARAM8 VALUE = '1       ' / Default: 1
HIERARCH ESO PRO R1C1 PARAM9 NAME = 'reduce.backsub.smoothx' / If spline int
erpoHIERARCH ESO PRO R1C1 PARAM9 VALUE = '-1      ' / Default: -1
HIERARCH ESO PRO R1C1 PARAM10 NAME = 'reduce.backsub.smoothy' / If spline in
terpHIERARCH ESO PRO R1C1 PARAM10 VALUE = '-1      ' / Default: -1
HIERARCH ESO PRO R1C1 PARAM11 NAME = 'reduce.extract.method' / Extraction me
thodHIERARCH ESO PRO R1C1 PARAM11 VALUE = 'optimal ' / Default: 'optimal'
HIERARCH ESO PRO R1C1 PARAM12 NAME = 'reduce.extract.kappa' / In optimal ext
ractHIERARCH ESO PRO R1C1 PARAM12 VALUE = '10      ' / Default: 10
HIERARCH ESO PRO R1C1 PARAM13 NAME = 'reduce.extract.chunk' / In optimal ext
ractHIERARCH ESO PRO R1C1 PARAM13 VALUE = '32      ' / Default: 32
HIERARCH ESO PRO R1C1 PARAM14 NAME = 'reduce.extract.profile' / In optimal e
xtraHIERARCH ESO PRO R1C1 PARAM14 VALUE = 'auto    ' / Default: 'auto'
HIERARCH ESO PRO R1C1 PARAM15 NAME = 'reduce.extract.skymethod' / In optimal
extHIERARCH ESO PRO R1C1 PARAM15 VALUE = 'optimal ' / Default: 'optimal'
HIERARCH ESO PRO R1C1 PARAM16 NAME = 'reduce.extract.oversample' / The overs
amplHIERARCH ESO PRO R1C1 PARAM16 VALUE = '-1      ' / Default: -1
HIERARCH ESO PRO R1C1 PARAM17 NAME = 'reduce.extract.best' / (optimal extrac
tionHIERARCH ESO PRO R1C1 PARAM17 VALUE = 'true    ' / Default: true
HIERARCH ESO PRO R1C1 PARAM18 NAME = 'reduce.slitlength' / Extraction slit l
engtHIERARCH ESO PRO R1C1 PARAM18 VALUE = '-1      ' / Default: -1
HIERARCH ESO PRO R1C1 PARAM19 NAME = 'reduce.skysub' / Do sky-subtraction (o
nly HIERARCH ESO PRO R1C1 PARAM19 VALUE = 'true    ' / Default: true
HIERARCH ESO PRO R1C1 PARAM20 NAME = 'reduce.objoffset' / Offset (in pixels)
of HIERARCH ESO PRO R1C1 PARAM20 VALUE = '0       ' / Default: 0
HIERARCH ESO PRO R1C1 PARAM21 NAME = 'reduce.objslit' / Object window size
(in pHIERARCH ESO PRO R1C1 PARAM21 VALUE = '-1      ' / Default: -1
HIERARCH ESO PRO R1C1 PARAM22 NAME = 'reduce.tiltcorr' / If enabled (recomme
ndedHIERARCH ESO PRO R1C1 PARAM22 VALUE = 'true    ' / Default: true
HIERARCH ESO PRO R1C1 PARAM23 NAME = 'reduce.ffmethod' / Flat-fielding metho
d. IHIERARCH ESO PRO R1C1 PARAM23 VALUE = 'extract ' / Default: 'extract'
HIERARCH ESO PRO R1C1 PARAM24 NAME = 'reduce.rebin.wavestep' / The bin size
(in HIERARCH ESO PRO R1C1 PARAM24 VALUE = '-1      ' / Default: -1
HIERARCH ESO PRO R1C1 PARAM25 NAME = 'reduce.rebin.scale' / Whether or not t
o muHIERARCH ESO PRO R1C1 PARAM25 VALUE = 'false   ' / Default: false
HIERARCH ESO PRO R1C1 PARAM26 NAME = 'reduce.merge' / Order merging method.
If 'HIERARCH ESO PRO R1C1 PARAM26 VALUE = 'optimal ' / Default: 'optimal'
HIERARCH ESO PRO R1C1 PARAM27 NAME = 'reduce.merge_delt1' / Order merging le
ft hHIERARCH ESO PRO R1C1 PARAM27 VALUE = '0       ' / Default: 0
HIERARCH ESO PRO R1C1 PARAM28 NAME = 'reduce.merge_delt2' / Order merging ri
ght HIERARCH ESO PRO R1C1 PARAM28 VALUE = '0       ' / Default: 0
HIERARCH ESO PRO R1C1 START = '2014-10-27T18:36:38'
HIERARCH ESO PRO R1C1 STOP = '2014-10-27T18:38:14'
HIERARCH ESO QC CHIP1 ORD1 OBJ SN = 176.5429 / Av. S/N at order center
HIERARCH ESO QC CHIP1 ORD1 OBJ POS = 22.3883 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP1 ORD1 OBJ FWHM = 6.8793 / Av. FWHM on order
HIERARCH ESO QC CHIP1 ORD1 OBJ RPLPAR = -1.0 / Av. relative ripple amplitude
HIERARCH ESO QC CHIP1 ORD2 OBJ SN = 213.4062 / Av. S/N at order center
HIERARCH ESO QC CHIP1 ORD2 OBJ POS = 22.268 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP1 ORD2 OBJ FWHM = 6.828 / Av. FWHM on order
```

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HIERARCH ESO QC CHIP1 ORD2 OBJ RPLPAR = 0.6252 / Av. relative ripple amplitu
de  HIERARCH ESO QC CHIP1 ORD3 OBJ SN = 215.2712 / Av. S/N at order center
HIERARCH ESO QC CHIP1 ORD3 OBJ POS = 22.1531 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP1 ORD3 OBJ FWHM = 6.7803 / Av. FWHM on order
HIERARCH ESO QC CHIP1 ORD3 OBJ RPLPAR = 0.5954 / Av. relative ripple amplitu
de  HIERARCH ESO QC CHIP1 ORD4 OBJ SN = 214.2806 / Av. S/N at order center
HIERARCH ESO QC CHIP1 ORD4 OBJ POS = 22.0416 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP1 ORD4 OBJ FWHM = 6.7376 / Av. FWHM on order
HIERARCH ESO QC CHIP1 ORD4 OBJ RPLPAR = 1.1847 / Av. relative ripple amplitu
de  HIERARCH ESO QC CHIP1 ORD5 OBJ SN = 215.5269 / Av. S/N at order center
HIERARCH ESO QC CHIP1 ORD5 OBJ POS = 21.9321 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP1 ORD5 OBJ FWHM = 6.6871 / Av. FWHM on order
HIERARCH ESO QC CHIP1 ORD5 OBJ RPLPAR = 0.6196 / Av. relative ripple amplitu
de  HIERARCH ESO QC CHIP1 ORD6 OBJ SN = 217.381 / Av. S/N at order center
HIERARCH ESO QC CHIP1 ORD6 OBJ POS = 21.8235 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP1 ORD6 OBJ FWHM = 6.6585 / Av. FWHM on order
HIERARCH ESO QC CHIP1 ORD6 OBJ RPLPAR = 0.6047 / Av. relative ripple amplitu
de  HIERARCH ESO QC CHIP1 ORD7 OBJ SN = 219.0132 / Av. S/N at order center
HIERARCH ESO QC CHIP1 ORD7 OBJ POS = 21.7148 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP1 ORD7 OBJ FWHM = 6.6066 / Av. FWHM on order
HIERARCH ESO QC CHIP1 ORD7 OBJ RPLPAR = 0.5993000000000001 / Av. relative ri
ppleHIERARCH ESO QC CHIP1 ORD8 OBJ SN = 220.341 / Av. S/N at order center
HIERARCH ESO QC CHIP1 ORD8 OBJ POS = 21.6059 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP1 ORD8 OBJ FWHM = 6.5676 / Av. FWHM on order
HIERARCH ESO QC CHIP1 ORD8 OBJ RPLPAR = 0.5309 / Av. relative ripple amplitu
de  HIERARCH ESO QC CHIP1 ORD9 OBJ SN = 219.7435 / Av. S/N at order center
HIERARCH ESO QC CHIP1 ORD9 OBJ POS = 21.4965 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP1 ORD9 OBJ FWHM = 6.5371 / Av. FWHM on order
HIERARCH ESO QC CHIP1 ORD9 OBJ RPLPAR = 0.5193 / Av. relative ripple amplitu
de  HIERARCH ESO QC CHIP1 ORD10 OBJ SN = 218.7253 / Av. S/N at order center
HIERARCH ESO QC CHIP1 ORD10 OBJ POS = 21.387 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP1 ORD10 OBJ FWHM = 6.5038 / Av. FWHM on order
HIERARCH ESO QC CHIP1 ORD10 OBJ RPLPAR = 0.6195000000000001 / Av. relative r
ipplHIERARCH ESO QC CHIP1 ORD11 OBJ SN = 215.7286 / Av. S/N at order center
HIERARCH ESO QC CHIP1 ORD11 OBJ POS = 21.2782 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP1 ORD11 OBJ FWHM = 6.4683 / Av. FWHM on order
HIERARCH ESO QC CHIP1 ORD11 OBJ RPLPAR = -1.0 / Av. relative ripple amplitud
e   HIERARCH ESO QC CHIP1 ORD12 OBJ SN = 214.8032 / Av. S/N at order center
HIERARCH ESO QC CHIP1 ORD12 OBJ POS = 21.171 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP1 ORD12 OBJ FWHM = 6.4351 / Av. FWHM on order
HIERARCH ESO QC CHIP1 ORD12 OBJ RPLPAR = 0.533 / Av. relative ripple amplitu
de  HIERARCH ESO QC CHIP1 ORD13 OBJ SN = 213.1103 / Av. S/N at order center
HIERARCH ESO QC CHIP1 ORD13 OBJ POS = 21.0669 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP1 ORD13 OBJ FWHM = 6.4017 / Av. FWHM on order
HIERARCH ESO QC CHIP1 ORD13 OBJ RPLPAR = 0.4771 / Av. relative ripple amplit
ude HIERARCH ESO QC CHIP1 ORD14 OBJ SN = 210.7704 / Av. S/N at order center
HIERARCH ESO QC CHIP1 ORD14 OBJ POS = 20.9678 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP1 ORD14 OBJ FWHM = 6.3684 / Av. FWHM on order
HIERARCH ESO QC CHIP1 ORD14 OBJ RPLPAR = 0.4586 / Av. relative ripple amplit
ude HIERARCH ESO QC CHIP1 ORD15 OBJ SN = 202.4064 / Av. S/N at order center
HIERARCH ESO QC CHIP1 ORD15 OBJ POS = 20.8756 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP1 ORD15 OBJ FWHM = 6.3449 / Av. FWHM on order
HIERARCH ESO QC CHIP1 ORD15 OBJ RPLPAR = 0.6327 / Av. relative ripple amplit
ude HIERARCH ESO QC CHIP1 ORD16 OBJ SN = 186.9775 / Av. S/N at order center
HIERARCH ESO QC CHIP1 ORD16 OBJ POS = 20.7931 / Av. OBJ POS at order center
HIERARCH ESO QC CHIP1 ORD16 OBJ FWHM = 6.3196 / Av. FWHM on order
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HIERARCH ESO QC CHIP1 ORD16 OBJ RPLPAR = -1.0 / Av. relative ripple amplitud
e   HIERARCH ESO QC CHIP1 EX NORD = 16 / No. of orders extracted
HIERARCH ESO PRO CATG = 'FLUXCAL_SCI_POINT_RED'
CHECKSUM= 'bZo7eXl6bXl6bXl6'   / HDU checksum updated 2018-10-24T18:09:27
DATASUM = '0       '           / data unit checksum updated 2014-10-29T10:4
1:19 ORIGFILE= 'UV_SFLX_1137109_2014-09-23T08:22:40.893_RED564d1_1x1_03.fit
s' / OrigiP3ORIG  = 'IDP     '           / ESO internal data product
HDRVER  = '2014-10-29T11:05:31.550' / Header timetag
COMMENT processed by HOTF_version : 1.1 on 2018-10-24T18:09:27
END
ColDefs(
    name = 'WAVE'; format = '134944D'; unit = 'Angstrom'
    name = 'FLUX_REDUCED'; format = '134944E'; unit = 'adu'
    name = 'ERR_REDUCED'; format = '134944E'; unit = 'adu'
    name = 'BGFLUX_REDUCED'; format = '134944E'; unit = 'adu'
    name = 'FLUX'; format = '134944E'; unit = '10^-16 erg/cm^2/s/Angstrom'
    name = 'ERR'; format = '134944E'; unit = '10^-16 erg/cm^2/s/Angstrom'
)
```

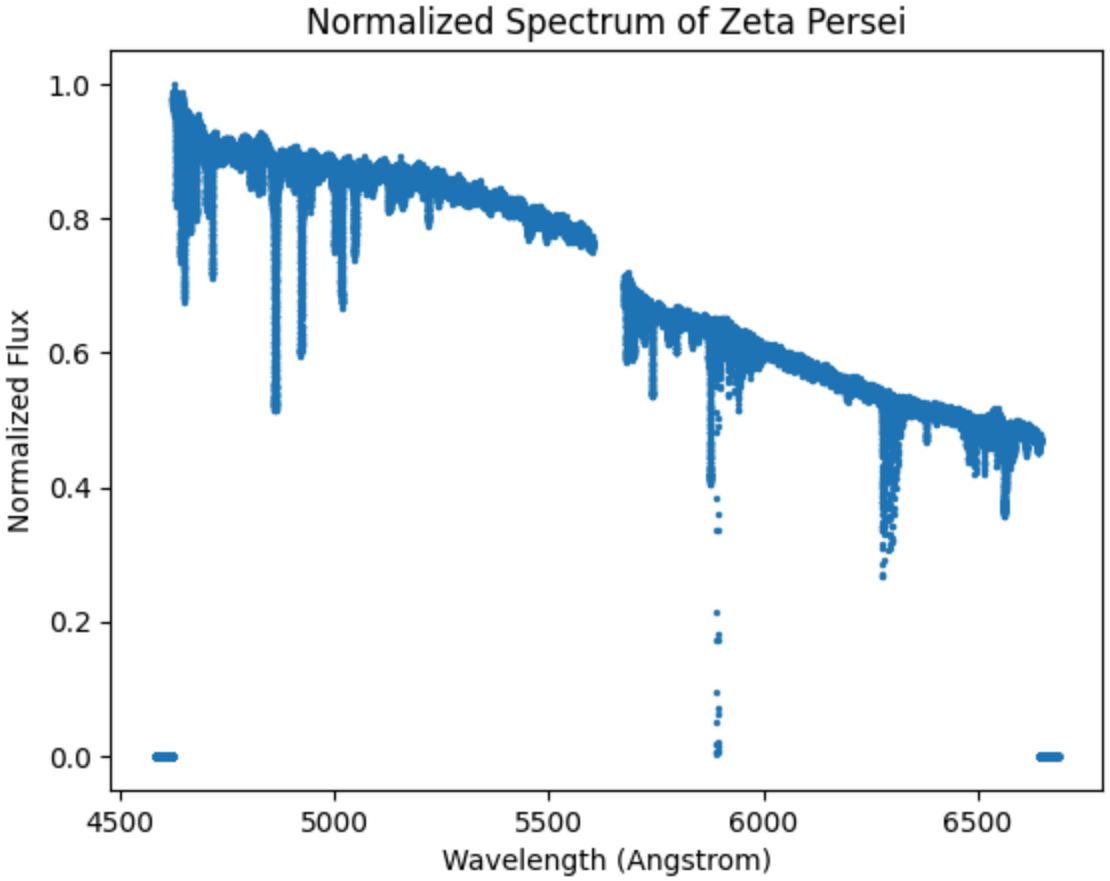

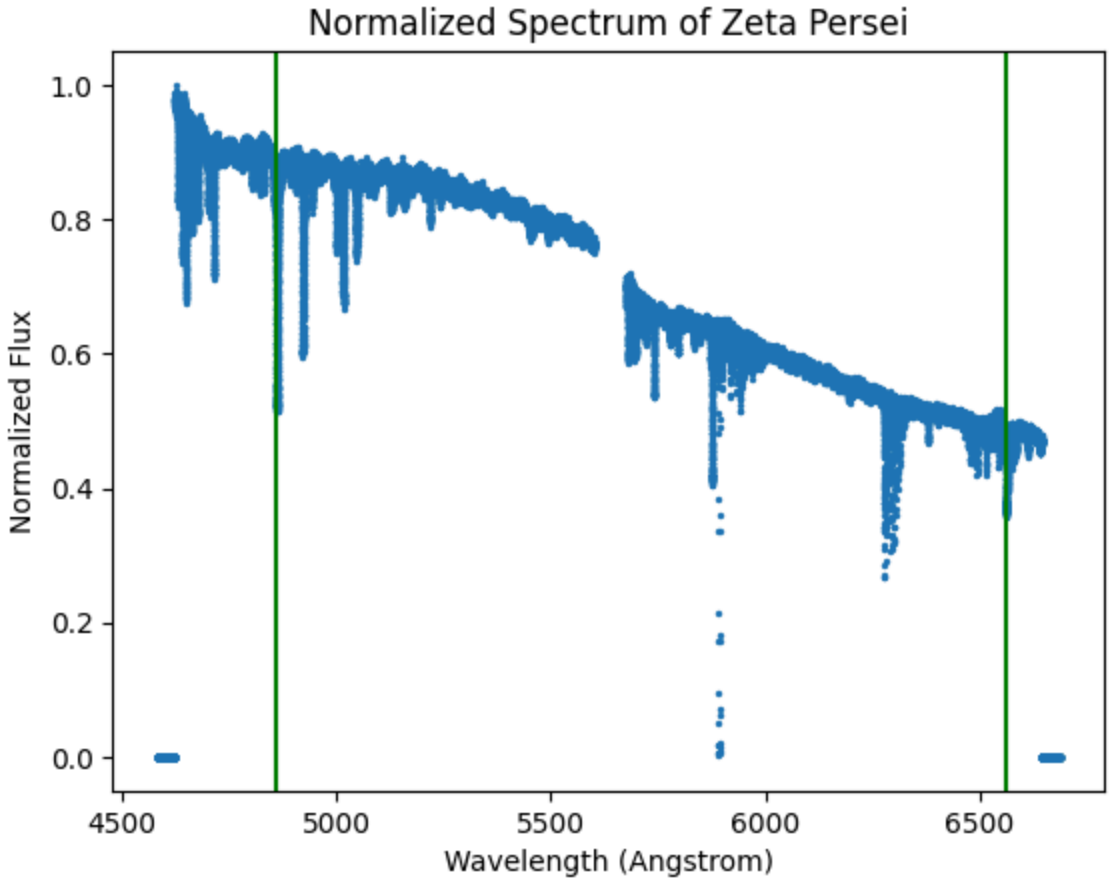

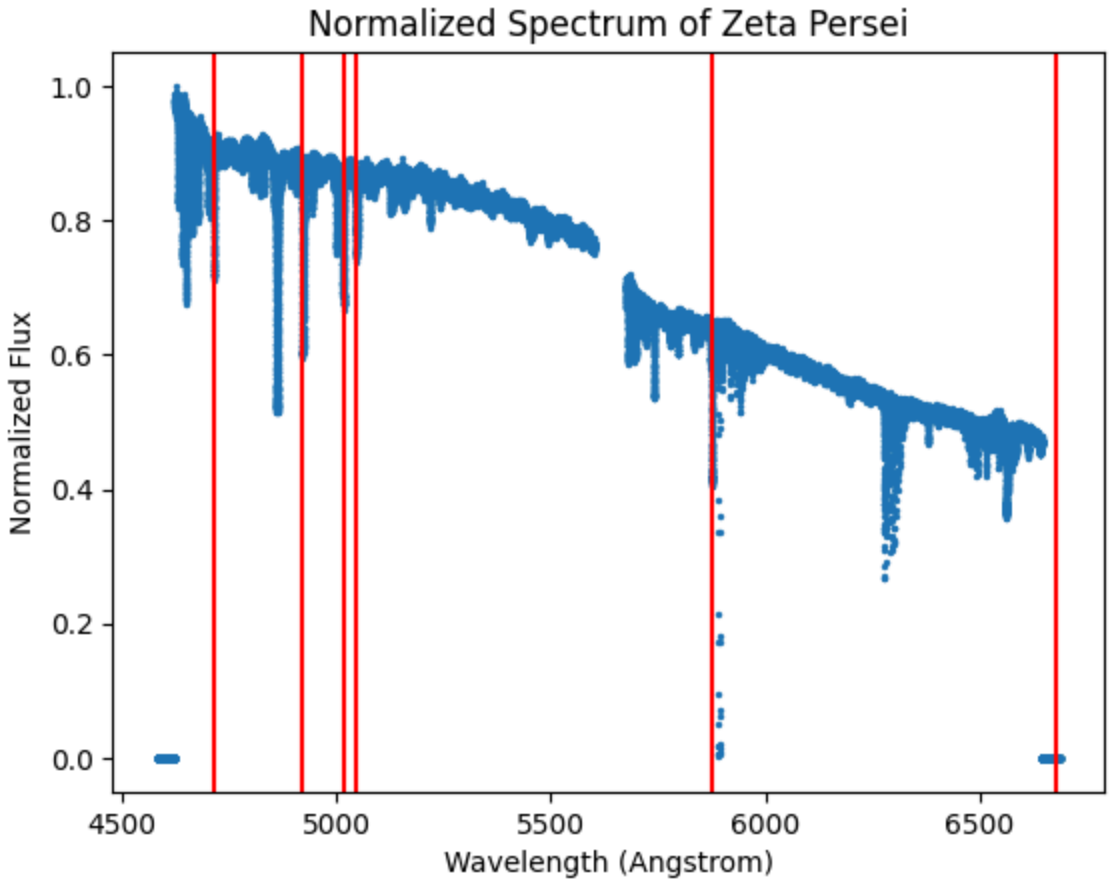

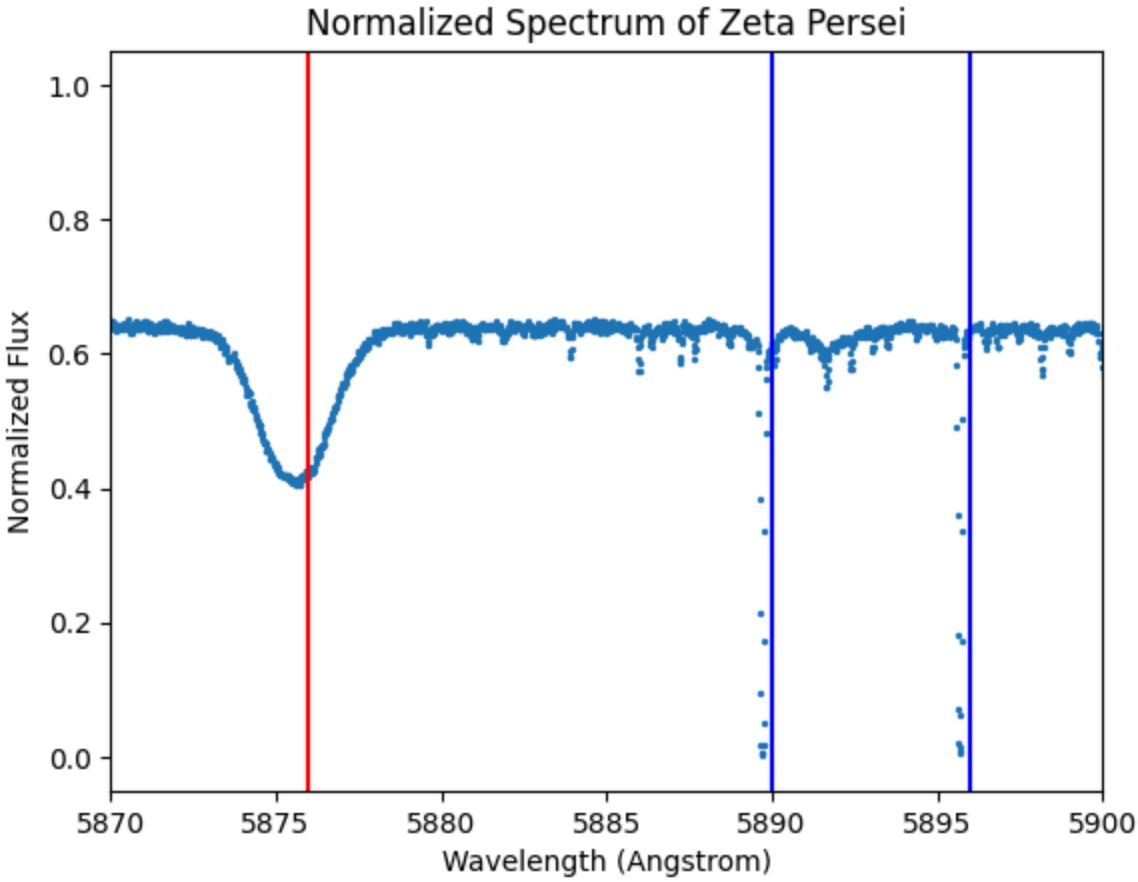

La velocidad radial de la estrella es: 2698157.5714909127 km / s