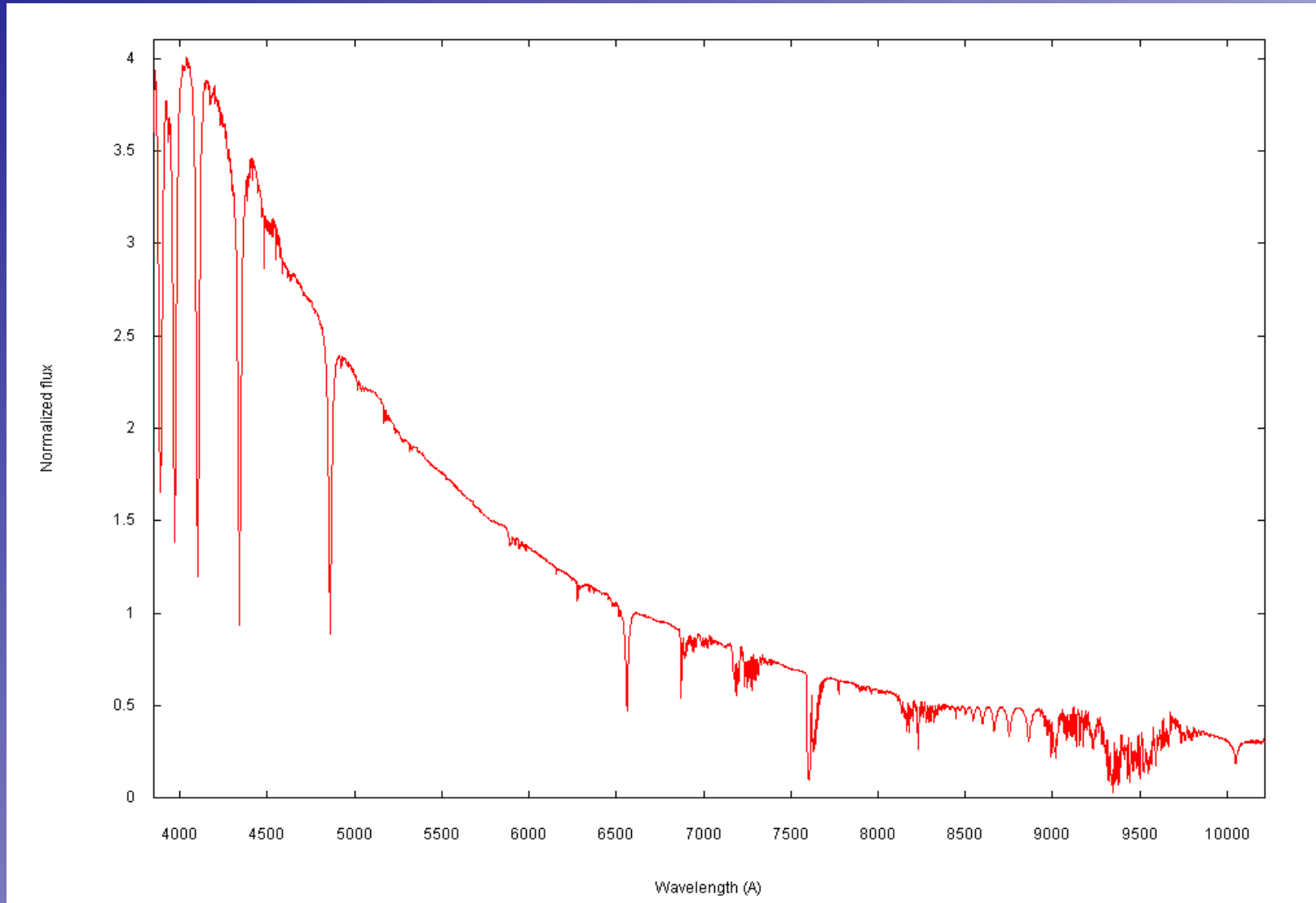


Fluxus kalibráció



Probléma:

a távcső + spektroszkóp + detektor érzékenységi görbéje hullámhosszfüggő

==> a mért spektrum eltorzul

$$F(\lambda) = S(\lambda) \cdot G(\lambda)$$

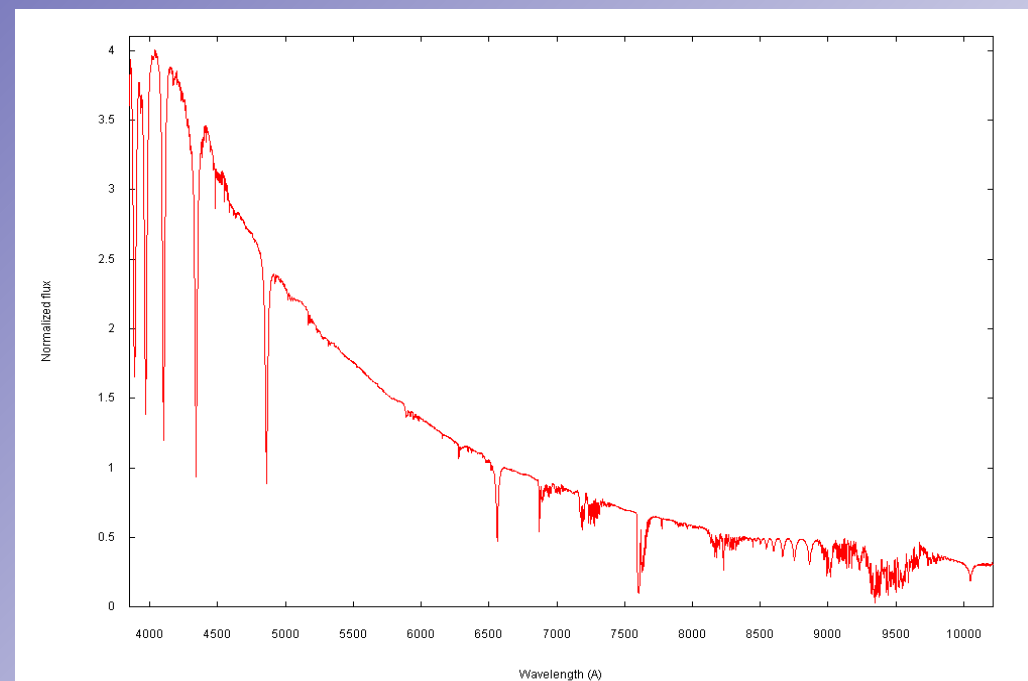
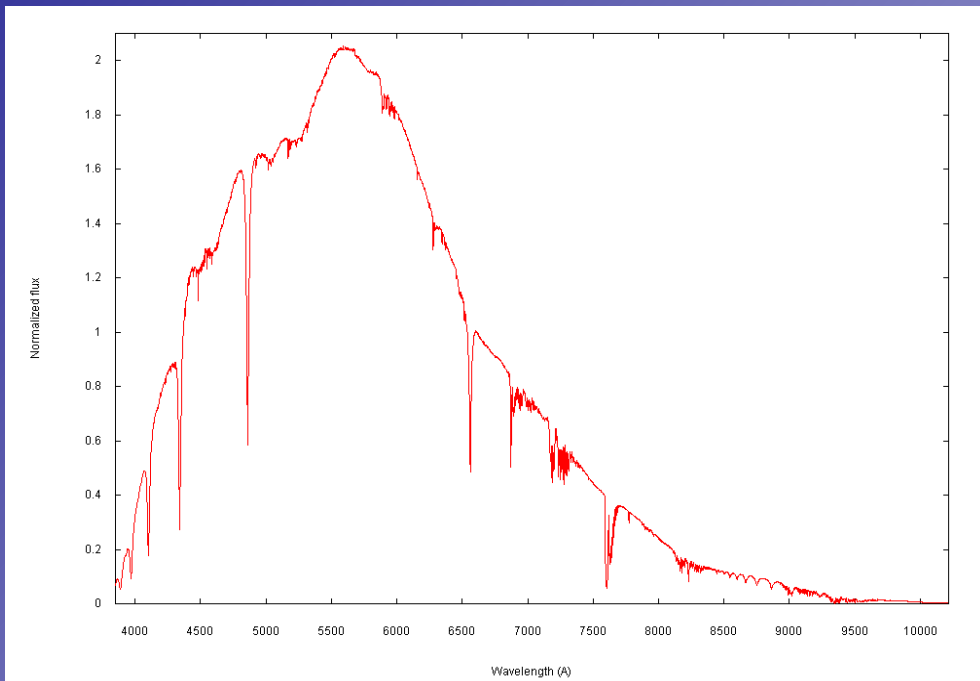
Megoldás: fluxus-kalibráció

Spektrális érzékenységi görbe meghatározása

Szükséges: spektrális standard csillag spektruma

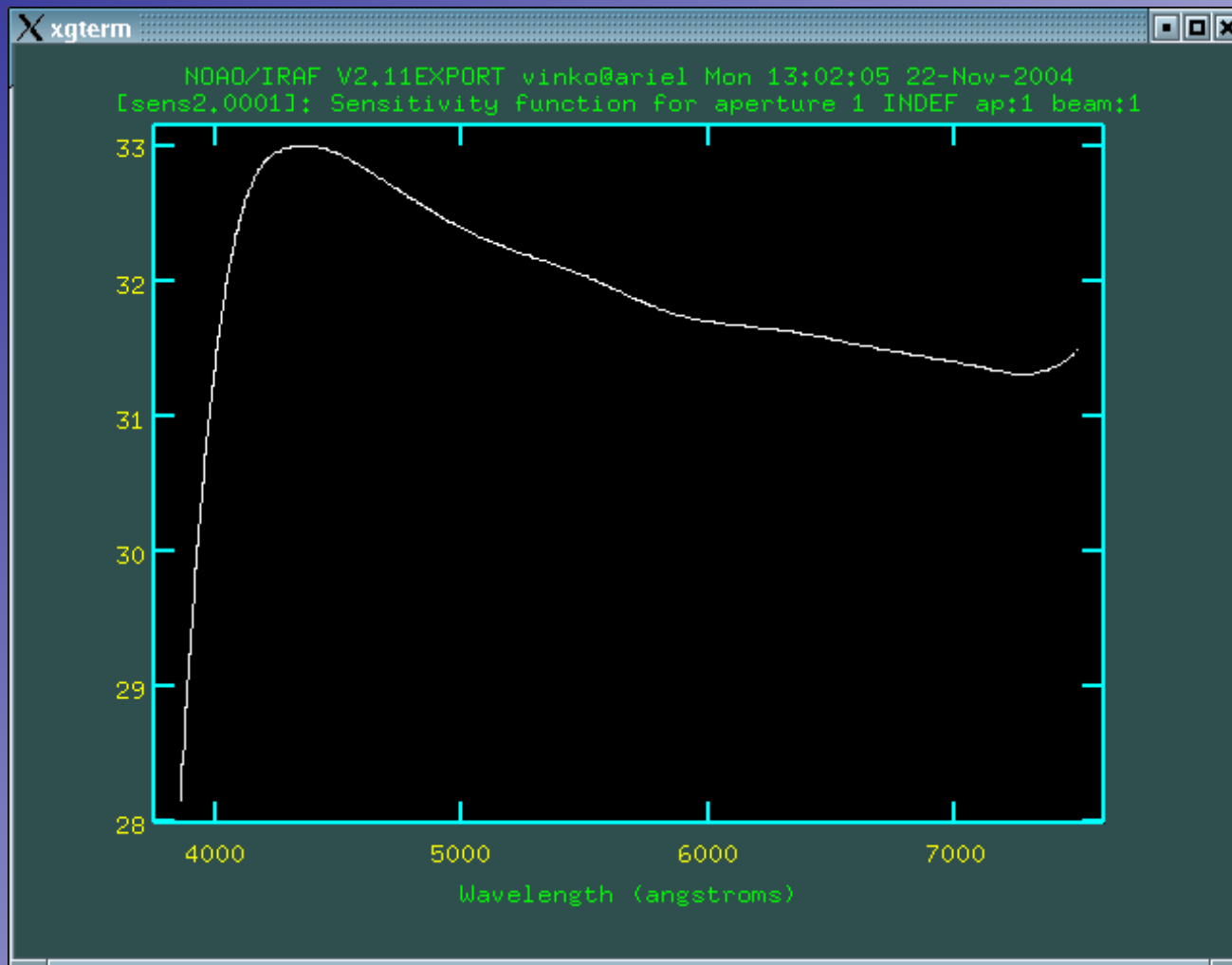
mért spektrum: $F(\lambda)$

"irodalmi" spektrum: $S(\lambda)$



Spektrális érzékenységi görbe meghatározása

$$G(\lambda) = F(\lambda)/S(\lambda)$$



Spektrális érzékenységi görbe meghatározása

IRAF-ben: imred/speccred/standard

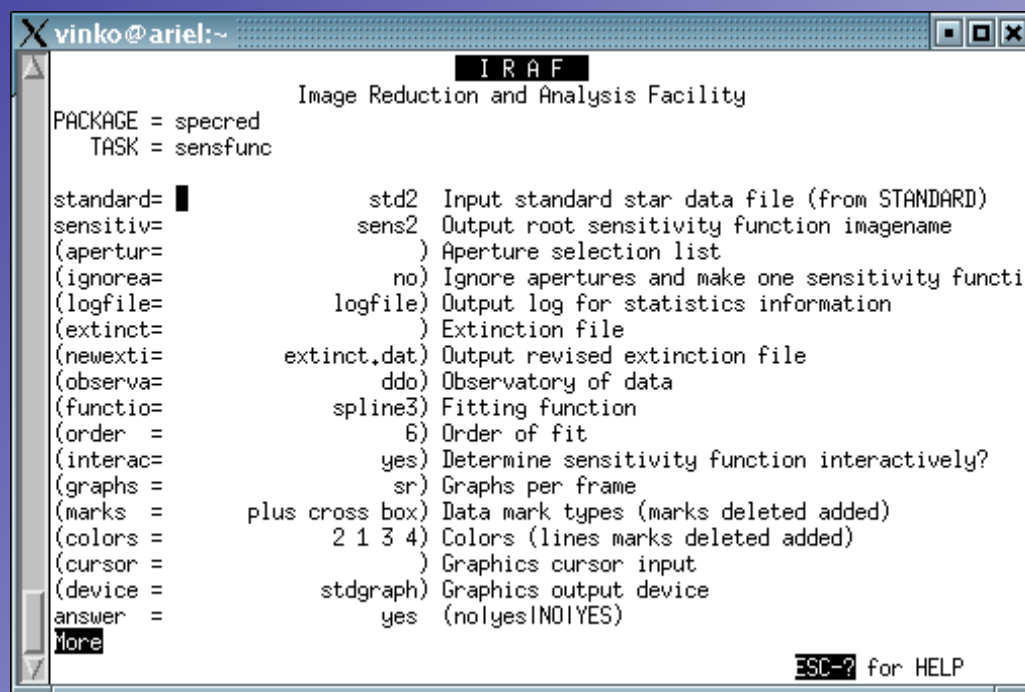
standard csillag mért spektrumának hozzáadása az adatbázishoz

```
vinko@ariel:~  
IRAF  
Image Reduction and Analysis Facility  
PACKAGE = speccred  
TASK = standard  
input =  hd74280_*.fits Input image file root name  
output =  std2 Output flux file (used by SENSFUNC)  
(samesta= yes) Same star in all apertures?  
(beam_sw= no) Beam switch spectra?  
(apertur= ) Aperture selection list  
(bandwid= INDEF) Bandpass widths  
(bandsep= INDEF) Bandpass separation  
(fnuzero= 3.6800000000000000E-20) Absolute flux zero point  
(extinct= ) Extinction file  
(caldir = onedstds$spec16cal/) Directory containing calibration data  
(observa= ddo) Observatory for data  
(interac= yes) Graphic interaction to define new bandpasses  
(graphic= stdgraph) Graphics output device  
(cursor = ) Graphics cursor input  
star_name= hr3454 Star name in calibration list  
airmass = Airmass  
exptime = Exposure time (seconds)  
More  
ESC-? for HELP
```

```
vinko@ariel:~  
IRAF  
Image Reduction and Analysis Facility  
PACKAGE = speccred  
TASK = standard  
More  
mag =  Magnitude of star  
magband =  Magnitude type  
teff =  Effective temperature or spectral type  
answer =  n (nolyesINOIYESINOIIYES!)  
(mode =  ql)  
ESC-? for HELP
```

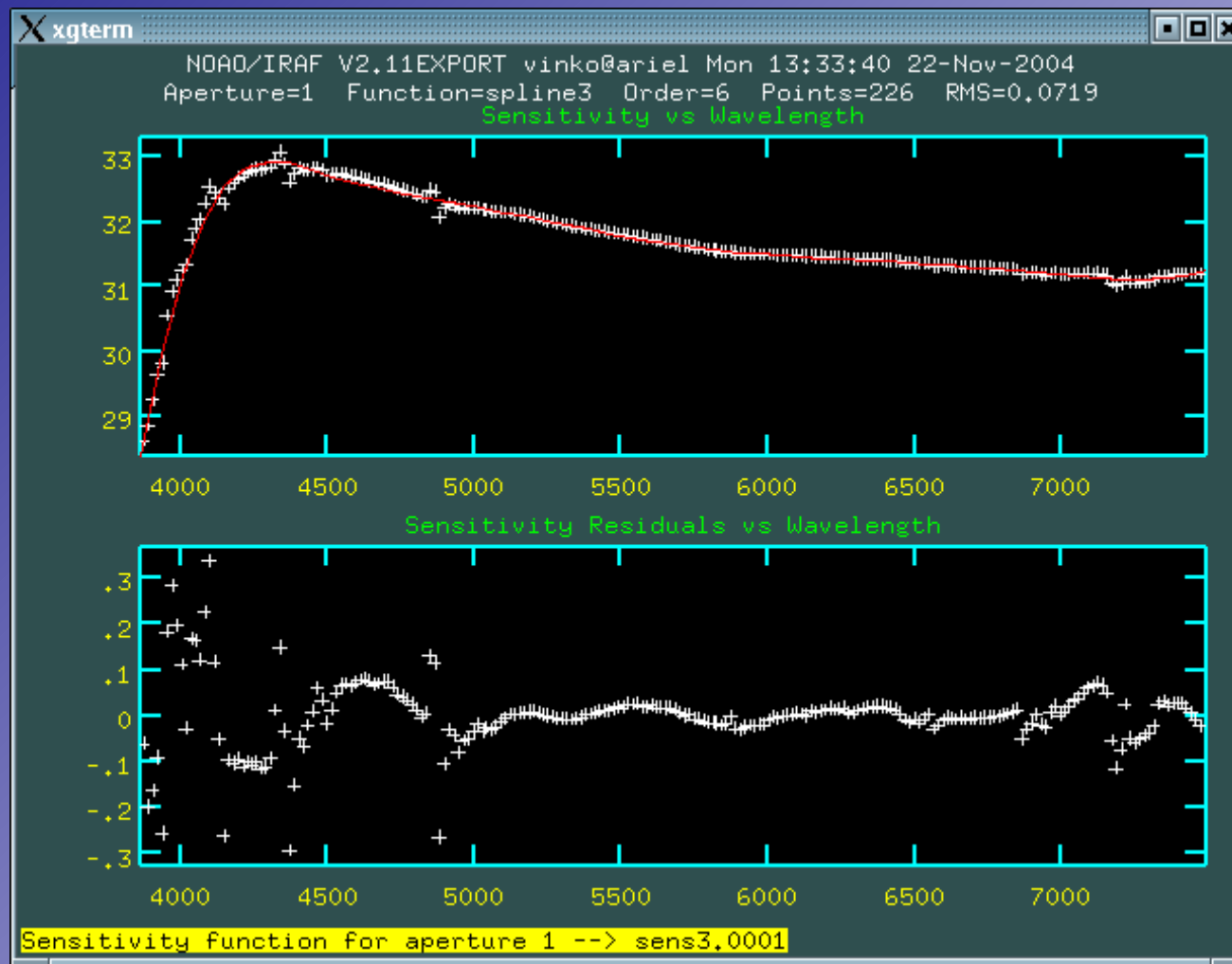
Spektrális érzékenységi görbe meghatározása

IRAF-ben: `imred/speccred/sensfunc`
az érzékenységi görbe meghatározása



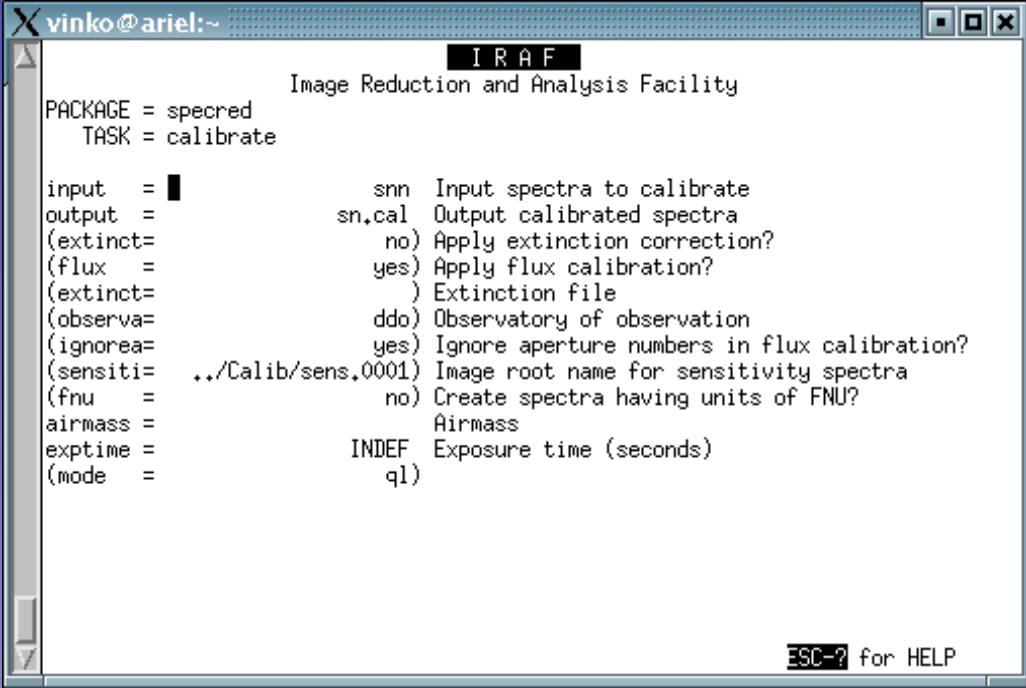
```
vinko@ariel:~  
IRAF  
Image Reduction and Analysis Facility  
PACKAGE = specred  
TASK = sensfunc  
standard=          std2  Input standard star data file (from STANDARD)  
sensitiv=          sens2  Output root sensitivity function imagename  
(apertur=          ) Aperture selection list  
(ignorea=          no) Ignore apertures and make one sensitivity functi  
(logfile=          logfile) Output log for statistics information  
(extinct=          ) Extinction file  
(newexti=          extinct.dat) Output revised extinction file  
(observa=          ddo) Observatory of data  
(functio=          spline3) Fitting function  
(order =          6) Order of fit  
(interac=          yes) Determine sensitivity function interactively?  
(graphs =          sr) Graphs per frame  
(marks =          plus cross box) Data mark types (marks deleted added)  
(colors =          2 1 3 4) Colors (lines marks deleted added)  
(cursor =          ) Graphics cursor input  
(device =          stdgraph) Graphics output device  
answer =          yes (no|yes|NO|YES)  
None  
ESC-? for HELP
```

Spektrális érzékenységi görbe meghatározása



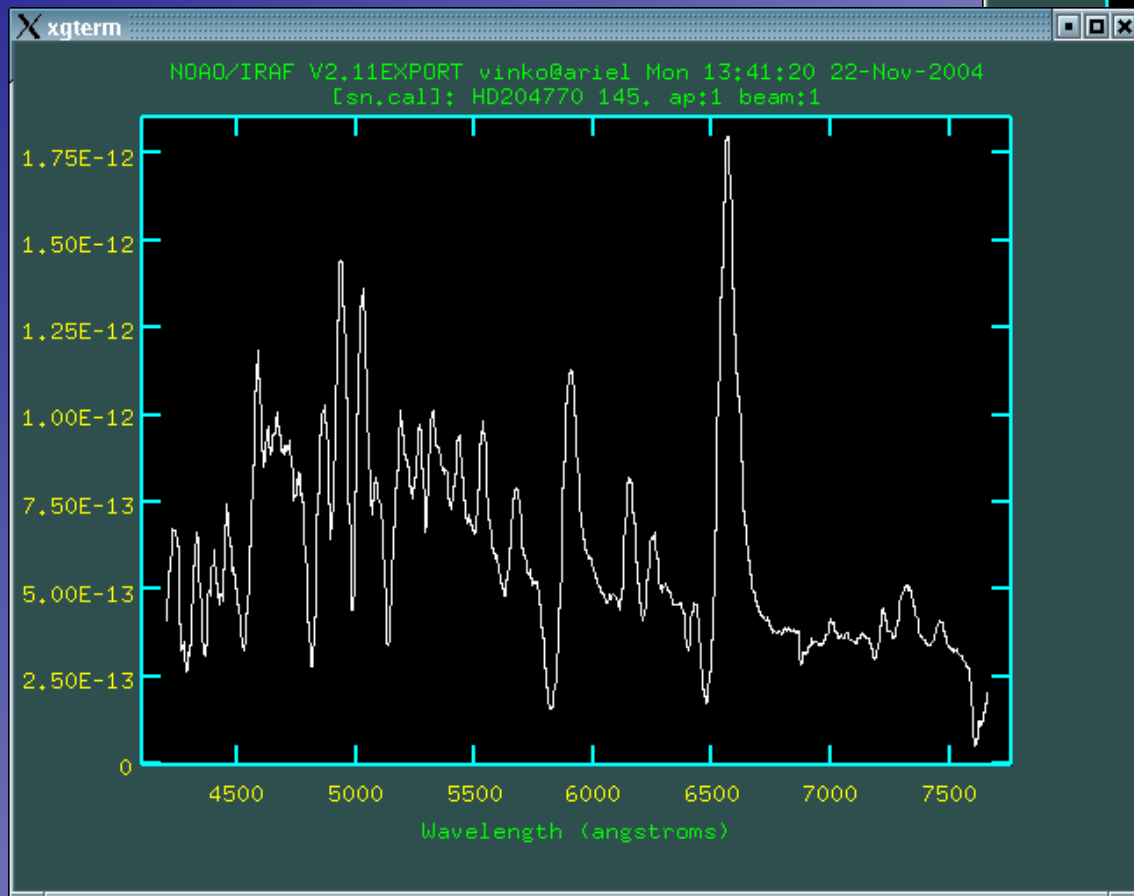
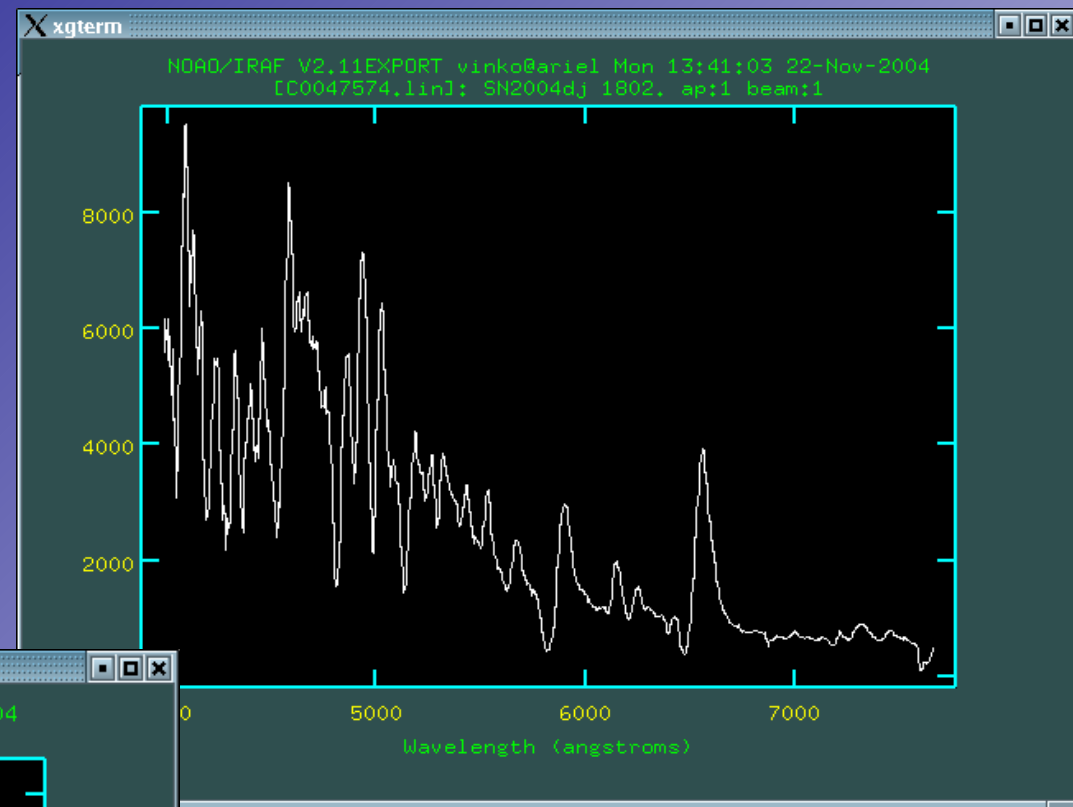
Fluxus kalibráció

imred/specrred/calibrate



```
vinko@ariel:~  
IRAF  
Image Reduction and Analysis Facility  
PACKAGE = specred  
TASK = calibrate  
  
input =  snn Input spectra to calibrate  
output =  sn.cal Output calibrated spectra  
(extinct=  no) Apply extinction correction?  
(flux =  yes) Apply flux calibration?  
(extinct=  ) Extinction file  
(observa=  ddo) Observatory of observation  
(ignorea=  yes) Ignore aperture numbers in flux calibration?  
(sensiti=  ../Calib/sens.0001) Image root name for sensitivity spectra  
(fnu =  no) Create spectra having units of FNU?  
airmass =  Airmass  
exptime =  INDEF Exposure time (seconds)  
(mode =  ql)  
  
ESC-? for HELP
```

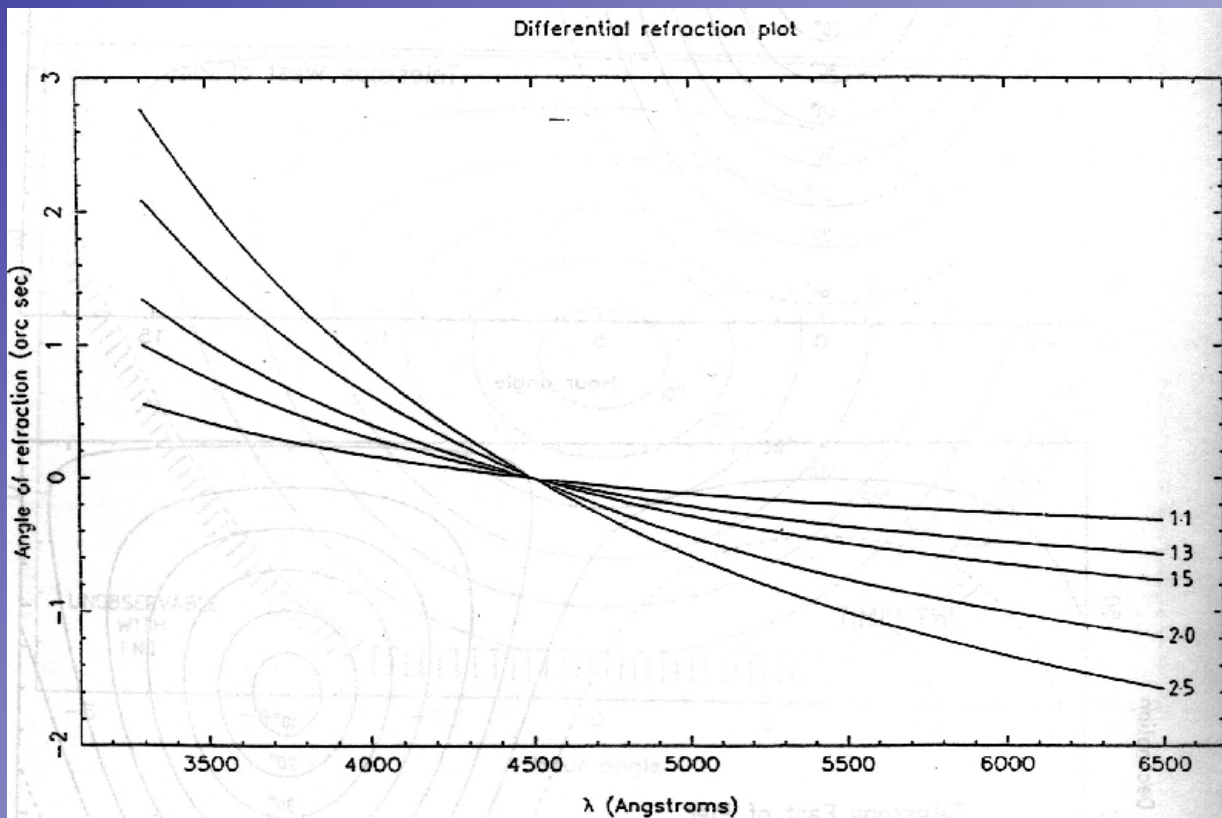
Fluxus kalibráció



Probléma: differenciális refrakció

Atmoszféra: diszperzív közeg

- pontforrás képe nem pontszerű lesz, hanem egy horizont felé mutató színes csík
- az effektus a nagyobb levegőtömegek felé nő



Probléma: differenciális refrakció

Megoldás: a spektrográf rését a horizonra merőlegesen kell irányítani

- altazimut szerelésnél: triviális
- parallaktikus szerelésnél: "parallaktikus szög"

