

**Cerro Tololo Inter-American Observatory**

**1.5-m telescope**

**1.5-m FIBER ECHELLE SPECTROGRAPH**

**Setup and test**

Last change: August 5, 2008

# Setup for 1.5-m fiber echelle

## GAM setup

1. Re-initialize GAM motors to get correct position reading
2. GAM probe position: X=-268, Y=+259, fixed for echelle
3. GAM focus: Z=-40.9. Telescope focus  $\approx 60$ .

## Spectrograph setup

Echelle: 31.6 l/mm, angle=568

Cross-disperser: #2, 226 l/mm, angle=1114

Slit width: 60 to 150 micron (to set, open to 200, then finish in the closing direction)

Decker: #6 (the smallest)

Dewar focus: 1.40mm (rotate clockwise to set). The focus may change with temperature, the ideal setting is CCD center  $\sim 0.1$  mm behind the focus)

## CCD setup

CCD dewar: SITE\_6

Data taking computer: ctioa2, user v17

Gain=4 [1.4 el/ADU] or Gain=1 [4.4 el/ADU]

Amplifiers: Upper (two upper amps. used)

For Iodine program: ystart=400, ysize=1200 (>setdet f+ to change)

## Switching Arcan between RC and Echelle

1. Stop Arcan session (Right-click Menu - End Session)
2. Switch optical fibers entering the TramBox (green fiber is connected to the right socket).  
Be careful not to damage the fiber ends!
3. Run the SetFiles program in the black window. The choices to make are listed in the table.

Parameter	Echelle	RCspec
Arcon version	Arcon3006 (6)	Arcon3009 (9)
Telescope	ct60 (3)	ct60 (3)
Focus	none (1)	cf75 (6)
Instrument	none (1)	cs60 (6)

4. Start Arcan session (Right-click Menu)
5. Run setdet f+ to set detector parameters.



holder. Be careful not to turn these screws by more than 1/4 of the revolution and always leave them tightened.

- Spectrograph focus. Take two 10-s Th-Ar exposures with the Hartmann mask in the “West” and “East” positions. Export the images to FITS and run `focus.pro` in IDL. If the spectrograph is properly focused, the FWHM of unsaturated Th-Ar lines near the center of the detector should be 1.8 pixels (slit width  $60\ \mu\text{m}$ , no masks).
- Take 10-s quartz exposure. Max count 12K ADU (gain=4) or 5K ADU (gain=1).
- With telescope at zenith, dome and mirror opened, take the spectrum of daytime sky. With 60s exposure, typical max. count 8–14K ADU (gain=4) or 3.2 times less for gain=1.