SARA-KP Observatory Details

Observatory Location

- Time Zone UTC -7
- Longitude WEST 111 DEG 36 MIN
- Latitude NORTH 31 DEG 58 MIN
- Elevation 2133 METERS

Telescope Parameters

- Clear Aperture 0.914 m
- Focal Length 6.858 m
- Effective f/ratio 7.5
- Field diameter 102 mm (48 arc min)
- Plate Scale 28.3 arcsec/mm
- Typical seeing ~2”

INSTRUMENTATION

Imaging CCD

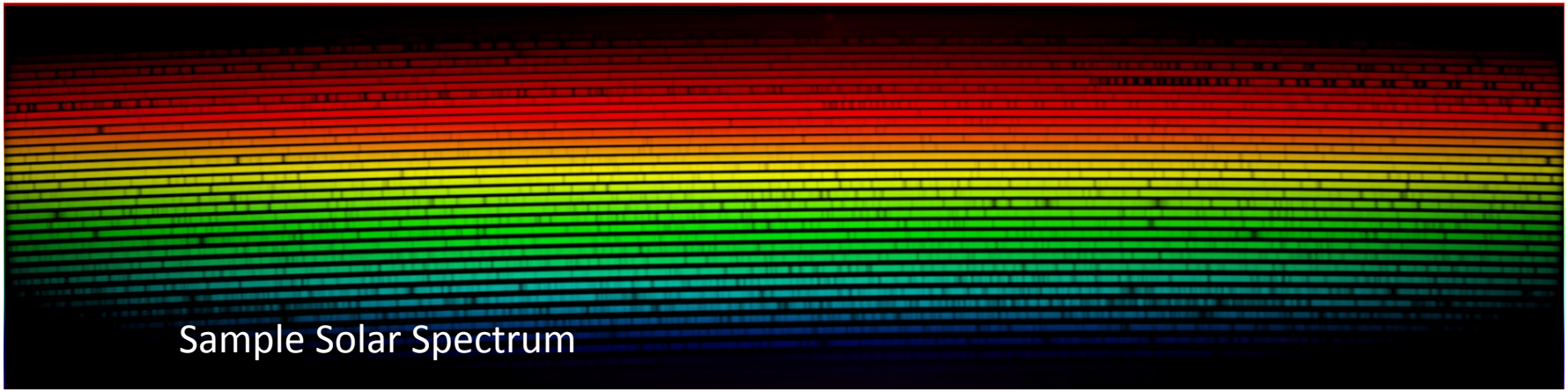
- ARC-E2V42-40 chip : 2048x2048, 13.5µ pixels : cooled to -110C
- Fov ~ 16.8’ , 0.493”/pixel
- 1 ADU/min (airmass 1.3) : V = 26.85

Currently Available Photometric Filters

SLOT	WHEEL #1	WHEEL #2
0	Empty	Empty
1	IR-BLOCKING	ND2
2	Bessel B	U
3	Bessel V	B
4	Bessel R	V
5	Bessel I	R
6	H-BETA	I
7	476/10 BC	657 / 7
8	H ALPHA	659 / 7
9	645 / 10 RC	664 / 7
10	683 / 13 CaH	671 / 7
11	[OIII] 5007	510 / 10 GC

Fiber Fed Echelle Spectrograph

- Echellogram coverage 3800-9100A
- number of spectral orders: 36
- cropping starts to occur at: 6900A
- crop fraction at reddest order: 25%
- minimal order separation: 10.5 pixels @7900A (1x1 bin)
- full width of order: 7.5 pixels (1x1 bin)
- sampling: 3.75 pixel/resolution element (1x1 bin)
- effective R(fiber) ~ 19,000
- estimated total efficiency ~25% (with 1”seeing and 2.8” fiber)
- Detector: FLI MicroLine ML1109 CCD with liquid cooling to -45C
- Th-Ar and Flat Field lamps for calibration



NOTE ON FAINT TARGET LIMIT FOR SPECTROSCOPY

Below is sample spectrum for the ~10th mag RR Lyr star RS Boo (if phase calc is correct, would have been ~10.5 mag with spectral type near F5 at the time). The image below is the result of 3, one hour long exposures that have been stacked with Bias and Dark frame subtraction (although only 3, one hour darks were averaged). No other calibration has been done to the image.

Tracking and seeing were very good for a relatively warm night, the 10th mag target was visible on the fiber plate easily enough (though quite faint). The target did completely disappear in the fiber end upon centering (as it should) and the guide star tracking worked very well throughout the night.

It is also noted that a spectrum was barely visible on the single one hour exposure raw images without any processing, but several hours of integration are required for any decent S/N ratio to be achieved for such faint, point source targets. The design limit was magnitude 12, but magnitude 11 appears a more realistic limit.