



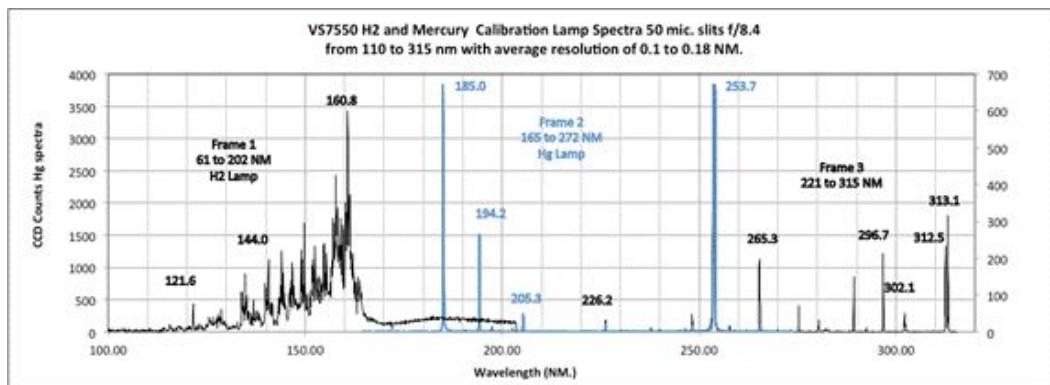
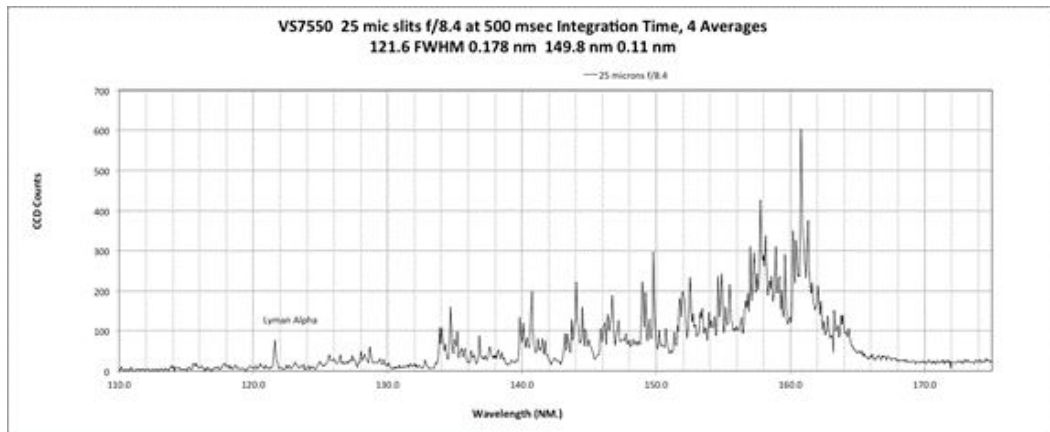
## VS7550



## VUV to NIR Mini-Spectrograph

The VS7550 is a miniature Czerny-Turner spectrograph with excellent speed, spectral range and spectral resolution with software control of slit size, input f#, order sorting filters, grating angle and dark exposures. For VUV operation, the spectrograph has a UHV window and laminar flow purge system, which allows operation down to the window short wavelength cut-off (112 nm for MgF2). The spectrograph is small enough to fit in your hand and can be fully operational in any orientation at the end of a 5-meter cable. Accessories include a built-in spectral calibration lamp, a multi-spectral field flat light source and low-cost accessories such as telescopes, vacuum adapters, and flow controllers.

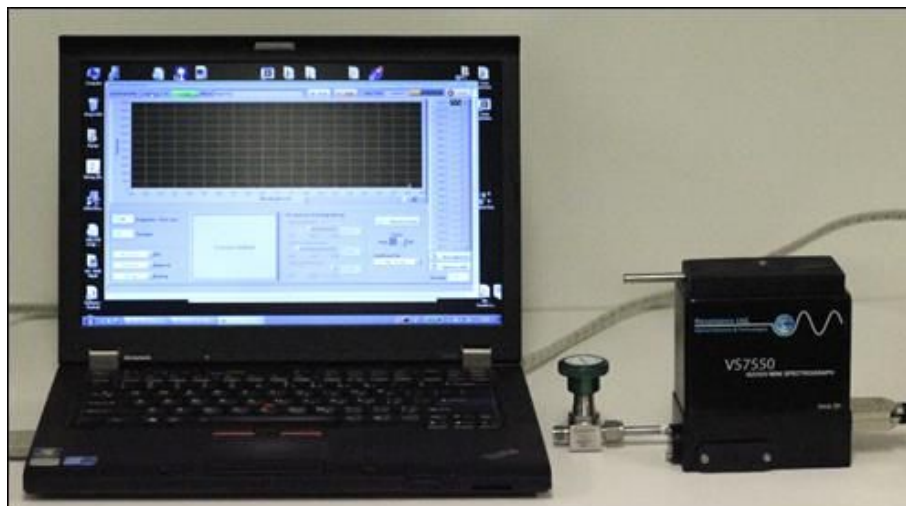
Spectra with 3600 grooves per mm grating using H2 VUV and Hg lamps

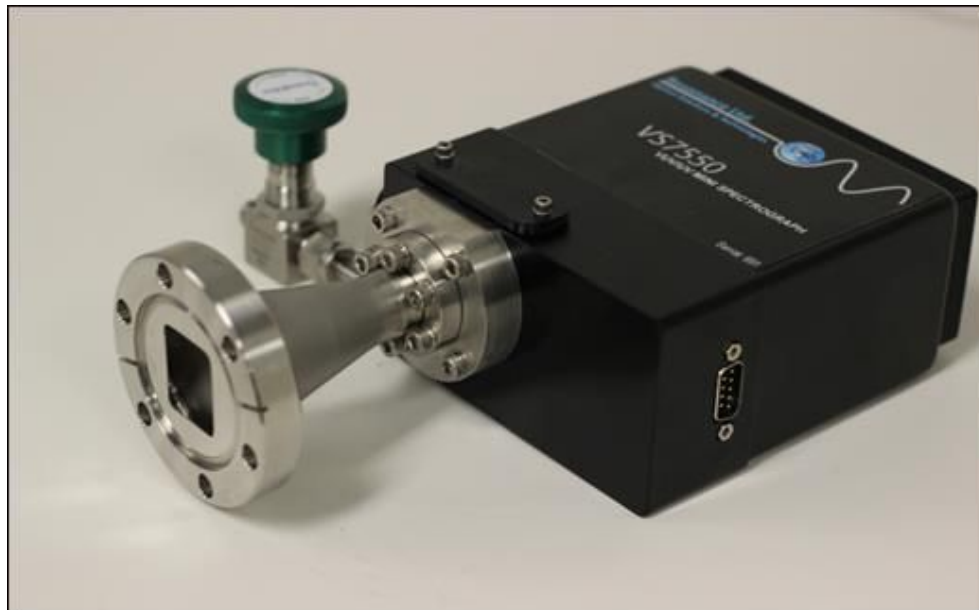
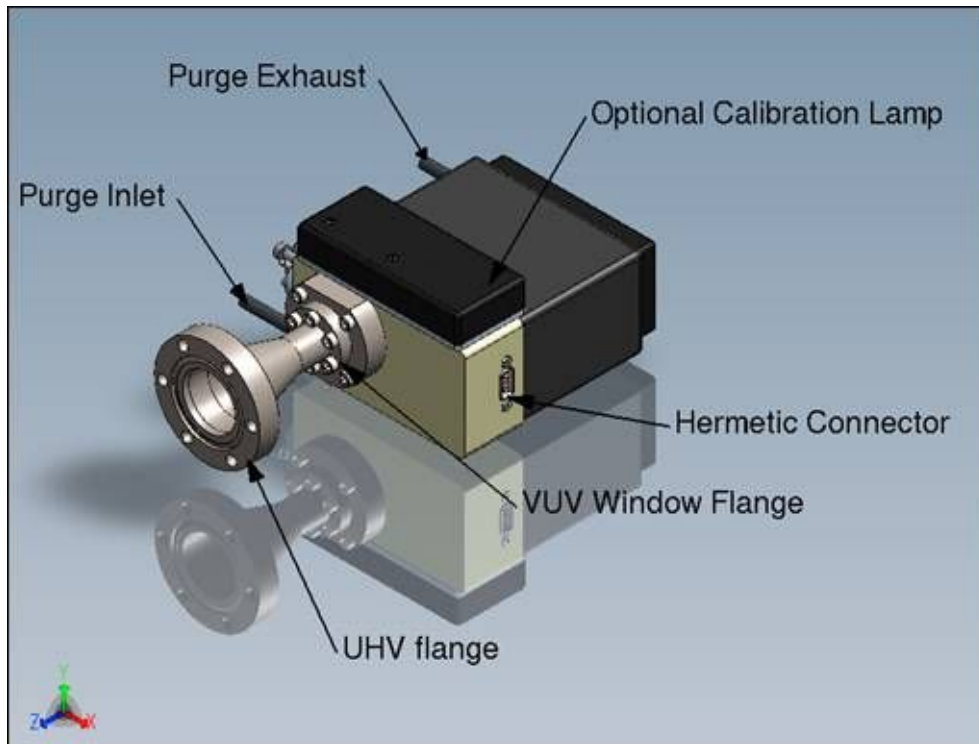




## Features

- High speed Czerny Turner optics up to f/3.2 (at CCD)
- Resolution better than 0.2 nm achieved with 3600 groove per mm grating
- User interchangeable gratings from 600 to 4200 grooves per mm
- 104 to 1030 NM with 1200 g/mm grating
- Computer controlled dark
- 5 Computer-controlled slit sizes from 25 to 400 microns
- Computer controlled input aperture from f/3.2, f/6.2 f/8.4
- Computer controlled order sorting (no filter and 220, 300, 600 long pass filters)
- Computer controlled grating angle means that full range of grating can be used by creating panoramic spectrum
- Laminar flow purge system allows operation down to 104 nm
- UHV interface with window so spectrograph can be removed from UHV chamber during bake out
- Stable detector employs phosphor coating to eliminate history effects of back-thinned detectors in VUV. Sensitivity range from 100 to 1000 NM.
- Simple USB interface for spectral acquisition and spectrograph control with up to 10 meter cable.
- Extremely compact so remote operation is allowable
- Accessories include built in calibration lamp, Flat fielding LED
- NIST traceable calibrations are optional







## Specifications

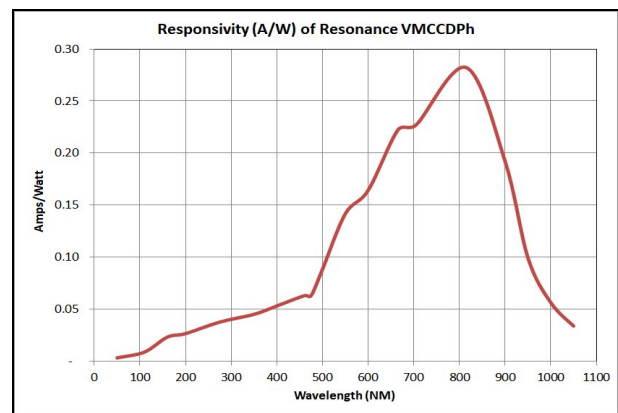
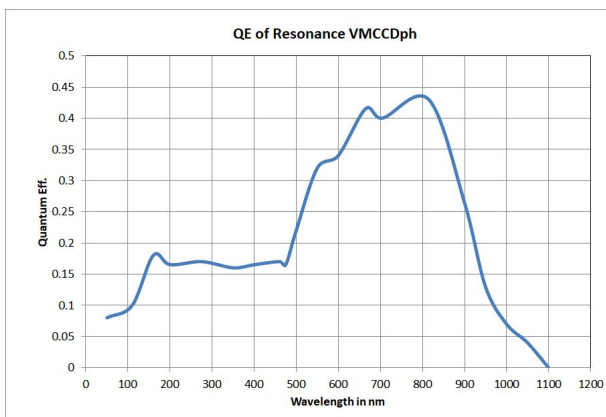
Electrical / Optical					
Specification	Minimum	Typical/ Median	Maximum	Units	Notes
Focal Length (input)	76.0	76.2	74.44	mm	
Focal Length (output)	41	46	48	mm	
Wavelength Range (600)	210		1040	nm	1 Grating Angle Step
Wavelength Range (1200)	104		1040	nm	3 Grating Angle Steps
Wavelength Range (1440)	104		850	nm	4 Grating Angle Steps
Wavelength Range (1800)	104			nm	4 Grating Angle Steps
Wavelength Range (2400)	104		510	nm	4 Grating Angle Steps
Wavelength Range (2880)	104		425	nm	4 Grating Angle Steps
Wavelength Range (3600)	104		340	nm	4 Grating Angle Steps
Wavelength Range (4200)	104		290	nm	4 Grating Angle Steps
Wavelength Accuracy (1200)		±0.35		nm	
Wavelength Accuracy (3600)	-	±0.12	-	nm	
CCD QE 110 - 400nm	10	18	20	%	
CCD QE 400 - 930nm	15	34	42	%	
CCD QE 930 - 1050nm	3	12	15	%	
Resolution 1200 25 mic f3.2	0.4	0.66	1	nm	
Resolution 2400 25 mic f3.2	0.2	0.33	0.5	nm	
Resolution 3600 25 mic f3.2	0.13	0.22	0.27	nm	
Available Gratings	From 600 to 4200 grooves per mm				
Software selectable slits, Order masks and dark	25, 50, 100, 200, 400 microns				



shutter		
Software selection of spectral range	3600 l/mm grating 110 to 315 (2 steps) 1200 l/mm grating 104 to 1040 (4 steps)	
Software selection grating aperture	Effective range of f# 3.2 to 8.4	
Detector	2048 pixel linear array with VUV/UV phosphor	
UHV option	Window adapter with 2.75" Conflat™ flange	
Connection	Two USB 2.0 cables for data, power and servo control	

### Spectral resolution of VS7550

Grating Grooves / mm	25 mic. f/3.2 full width at half maximum (nm)	25 mic. f/6.2 full width at half maximum (nm)	25 mic. f/8.2 full width at half maximum (nm)
600	1.61	1.05	0.91
1200	0.81	0.53	0.46
1440	0.67	0.44	0.38
1800	0.54	0.35	0.30
2400	0.40	0.26	0.23
2880	0.34	0.22	0.19
3600	0.27	0.18	0.15
4200	0.23	0.15	0.13

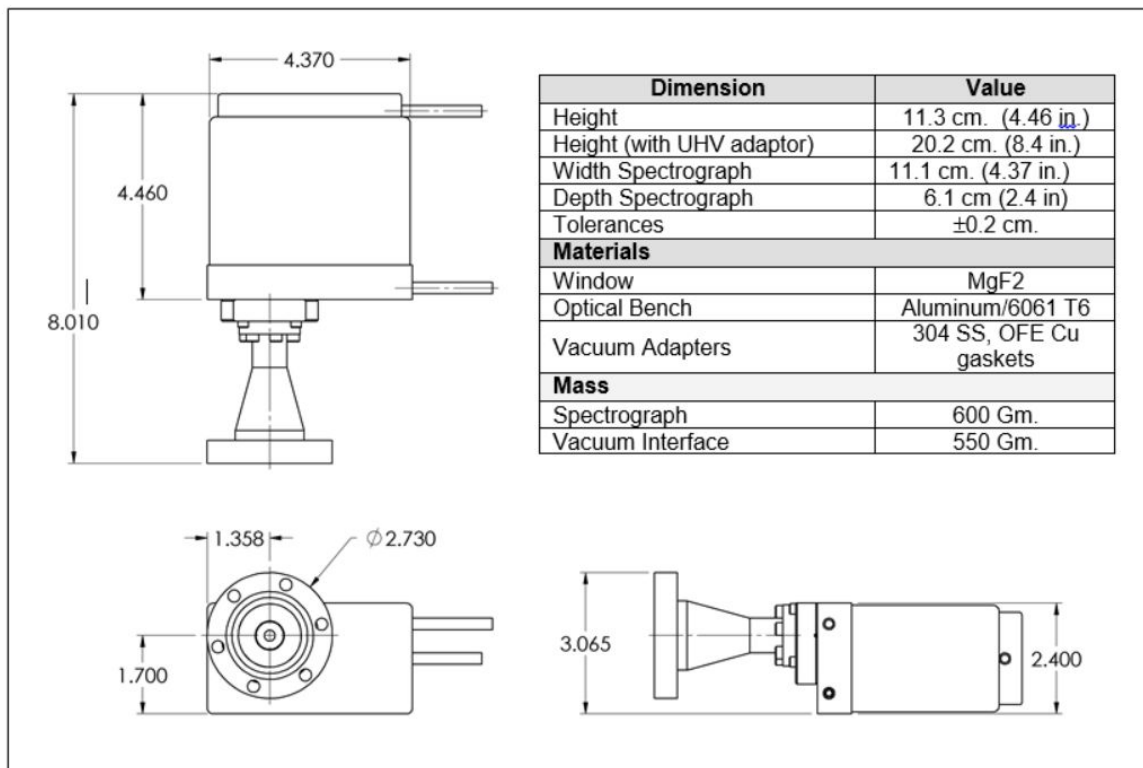


Thermal				
Non-operational Temp. Range	-20	22	70	°C
Temp. Range of vacuum flange plus window	-50	22	220	°C
Ultimate vacuum of adapter	1e-14	1e-10	1e-9	mbar
Electrical				
System Power Source (USB HUB)	USB 2.0			
Current consumption	<500 mA			

## Vacuum Interface

Front 2.75 in flange can be attached to UHV chamber. Spectrograph is isolated with MgF2 window in vacuum adapter. Purge can be dry N2, Ar, or He.

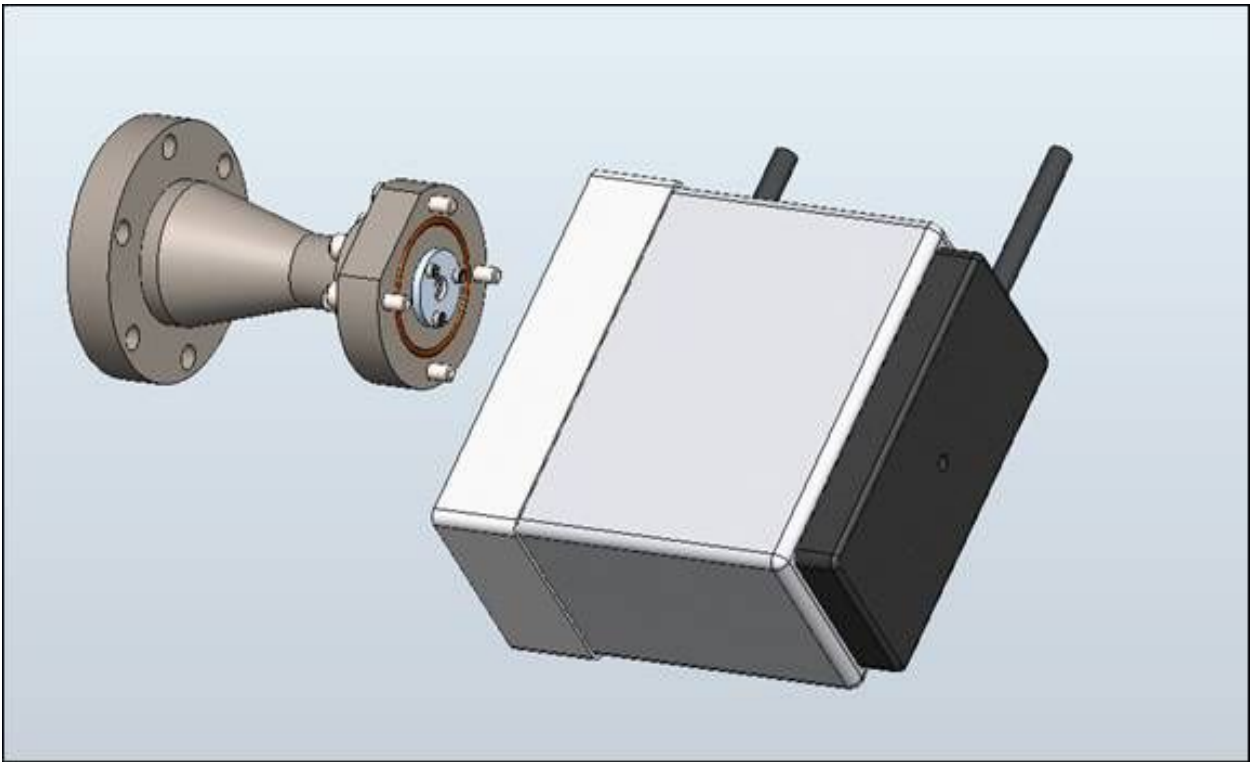
The Spectrometer can be removed from a vacuum chamber without breaking vacuum. This allows bake out of the UHV chamber above the non-operational limit of the spectrometer.



## Software and Drivers

A PC software package which controls all the spectrometer functions, displays and stores spectral data is provided.

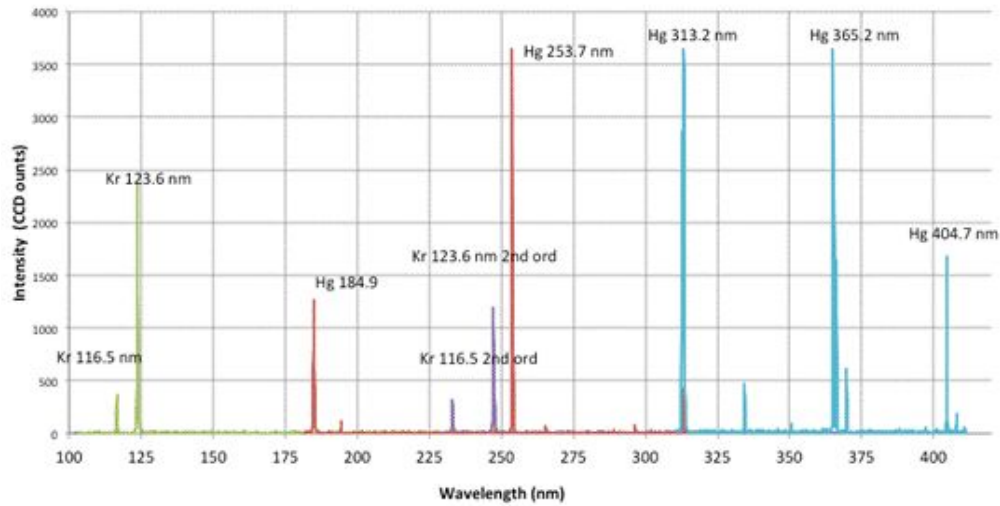
Capabilities include:



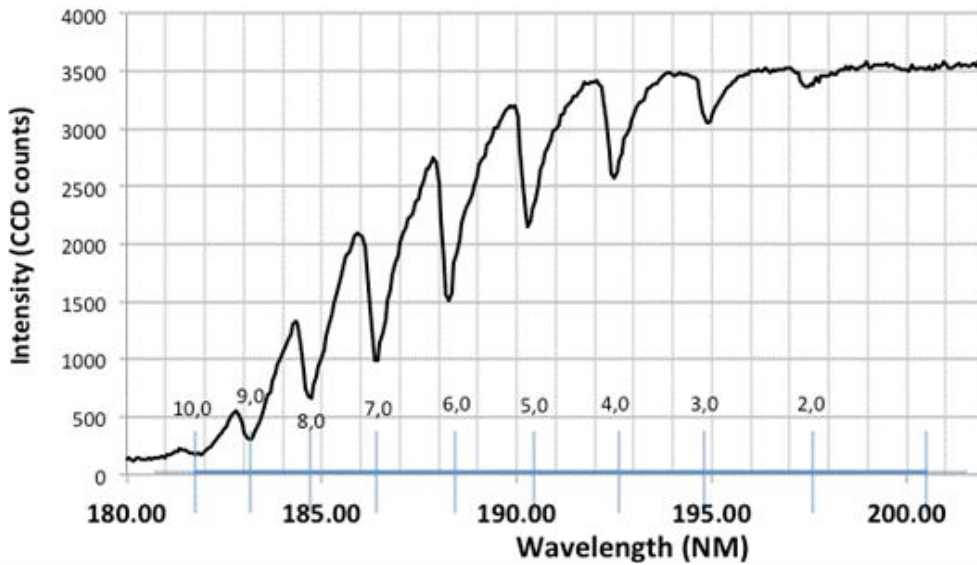
- Changing all CCD parameters (wavelength coefficients, integration time)
- Slit width control
- Spectrograph wavelength range control.
- Spectrograph input aperture (input f#)
- Spectrograph order sorting filter
- Pixel or Wavelength Display
- Software activated darks
- Data export (XLS User selectable)
- Store multiple spectra and graph/save multiple spectra



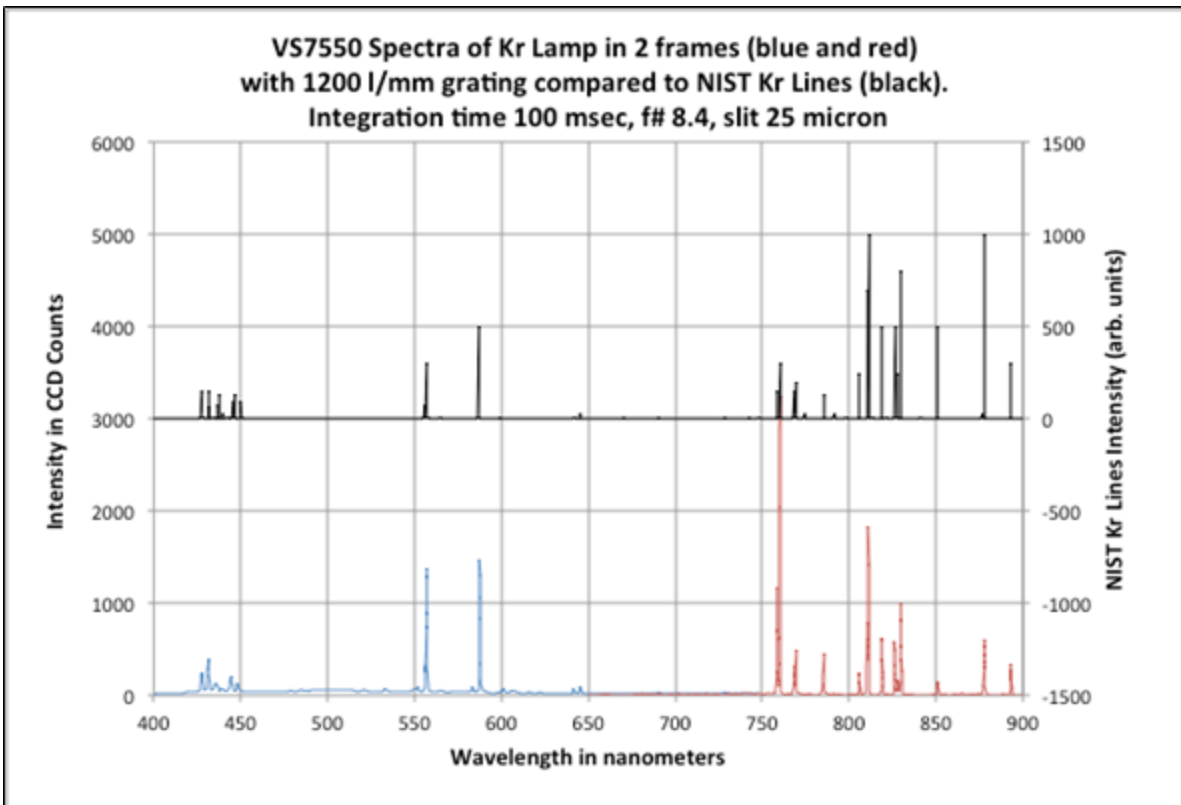
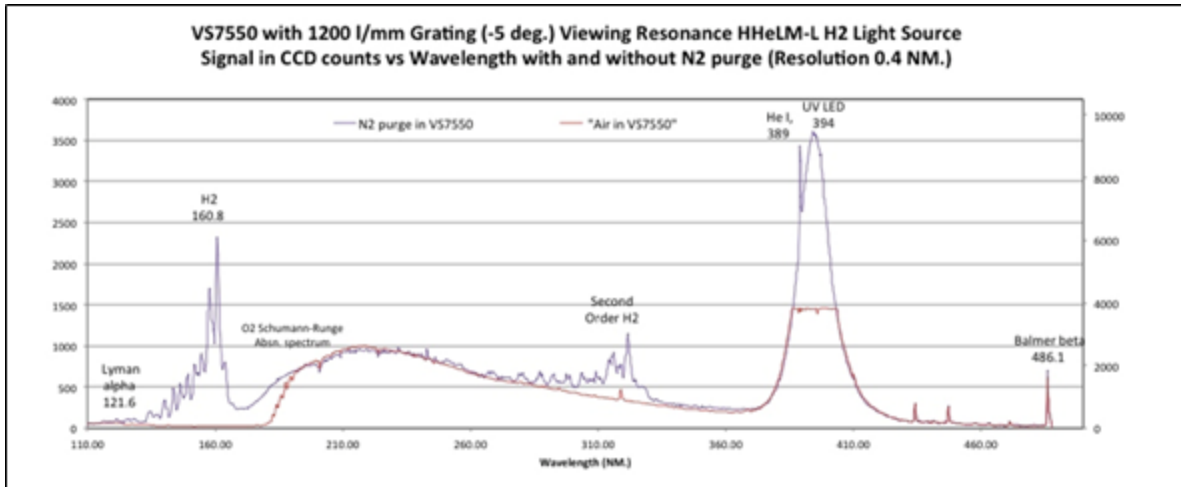
**UV/VUV Spectrum with VS7550**  
4 frames with 2880 g/mm grating



**VS7550 viewing Schumann-Runge O<sub>2</sub> Absorption Bands**  
Conditions: Resonance H<sub>2</sub> light source, 50 micron slits, f/8.4 aperture  
10 sec integration time, 1 average with Flat field correction 25 cm air path

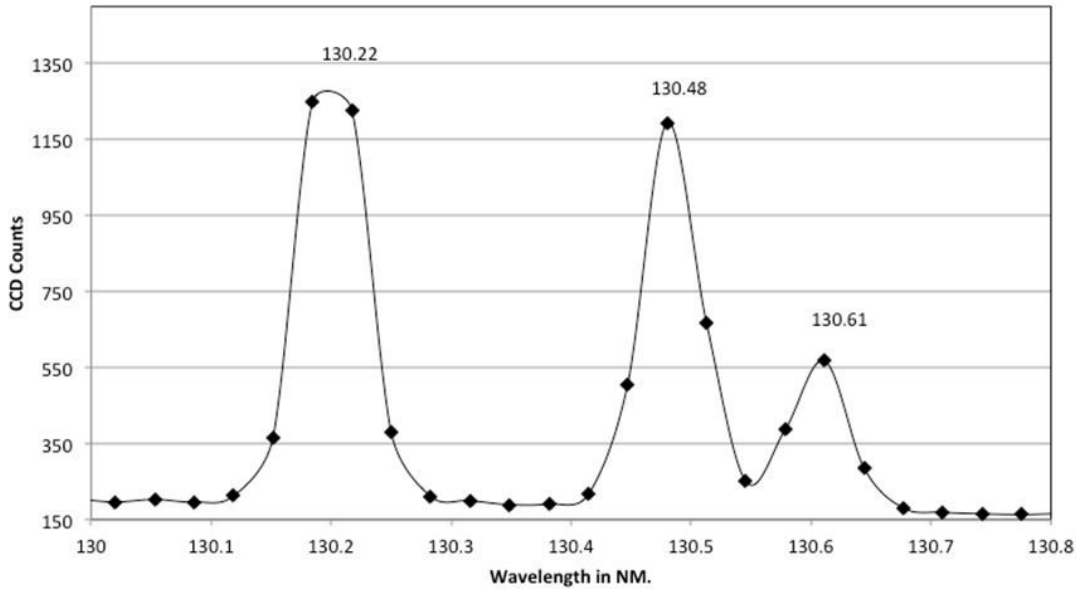








**VS7550 Spectrum of Atomic Oxygen Triplet**  
 2880 g/mm grating, 2nd order, 25 mic. slit, f8.4 with resolution of 0.075 NM.



**VS7550 VUV/UV Spectrum of Resonance Argon continuum lamp**  
 2880 g/mm grating, 25 micron slits, f/8.4 fwhm 0.18 nm

