

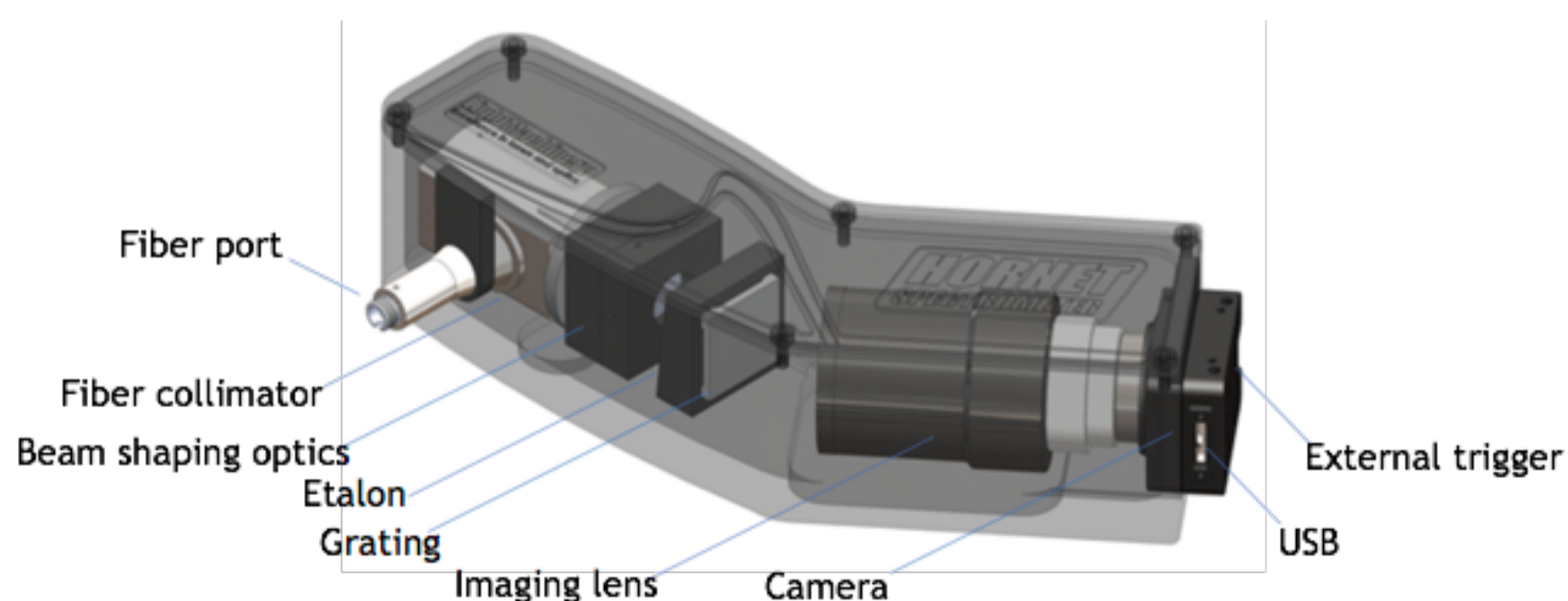


## HORNET SPECTROMETER

Compact, Low Cost, 10-30pm Resolution in the Visible or NIR

The Hornet series of spectrometers are based on LightMachinery's high finesse etalons. They are designed primarily for measuring CW or pulsed laser spectra in real time, for characterizing passive components, and for solar spectroscopy. The Hornet spectrometer from LightMachinery is an ultra compact, low cost spectrometer capable of achieving the resolution of large grating spectrometers at a fraction of their cost and size while covering a large range. Simple PC based software allows the user to review spectra in real time and save or export for more analysis. LabView drivers enable the Hornet spectrometer to be integrated into automated experimental setups.

### How does it work?



Light enters the Hornet Spectrometer through a fiber. An etalon, manufactured using LightMachinery's proprietary fluid jet polishing technology, is used to produce very high dispersion in the vertical axis with sub-30 picometer resolution.

This is followed by a conventional grating to disperse overlapping orders in the horizontal direction and produce a 2D spectrum of the input light. LightMachinery's software unwraps the spectrum to produce an ultra high resolution wavelength spectrum of the input light.

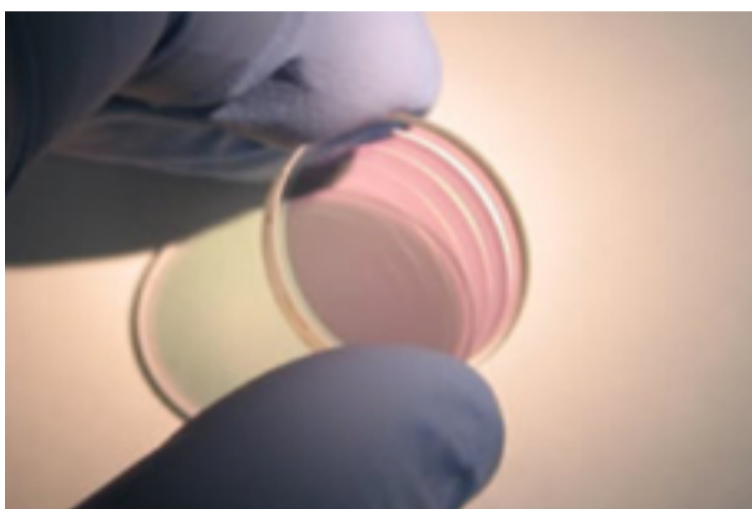
## Features

- Wavelength range: 50nm anywhere in the visible or NIR, or the full visible (425-720nm)
- 10-30pm resolution
- Fiber coupled
- Simple USB interface
- LabView Drivers
- No Moving parts
- Can be triggered externally

## Benefits

- Average range-over-resolution ratio up to 13000
- Ultra compact
- Can measure the spectrum of both CW and pulsed sources
- Single shot acquisition
- Fast, real-time measurements (up to 10Hz)
- Ultra reliable
- Easy to calibrate
- LightMachinery's legendary customer support

## Key Technology



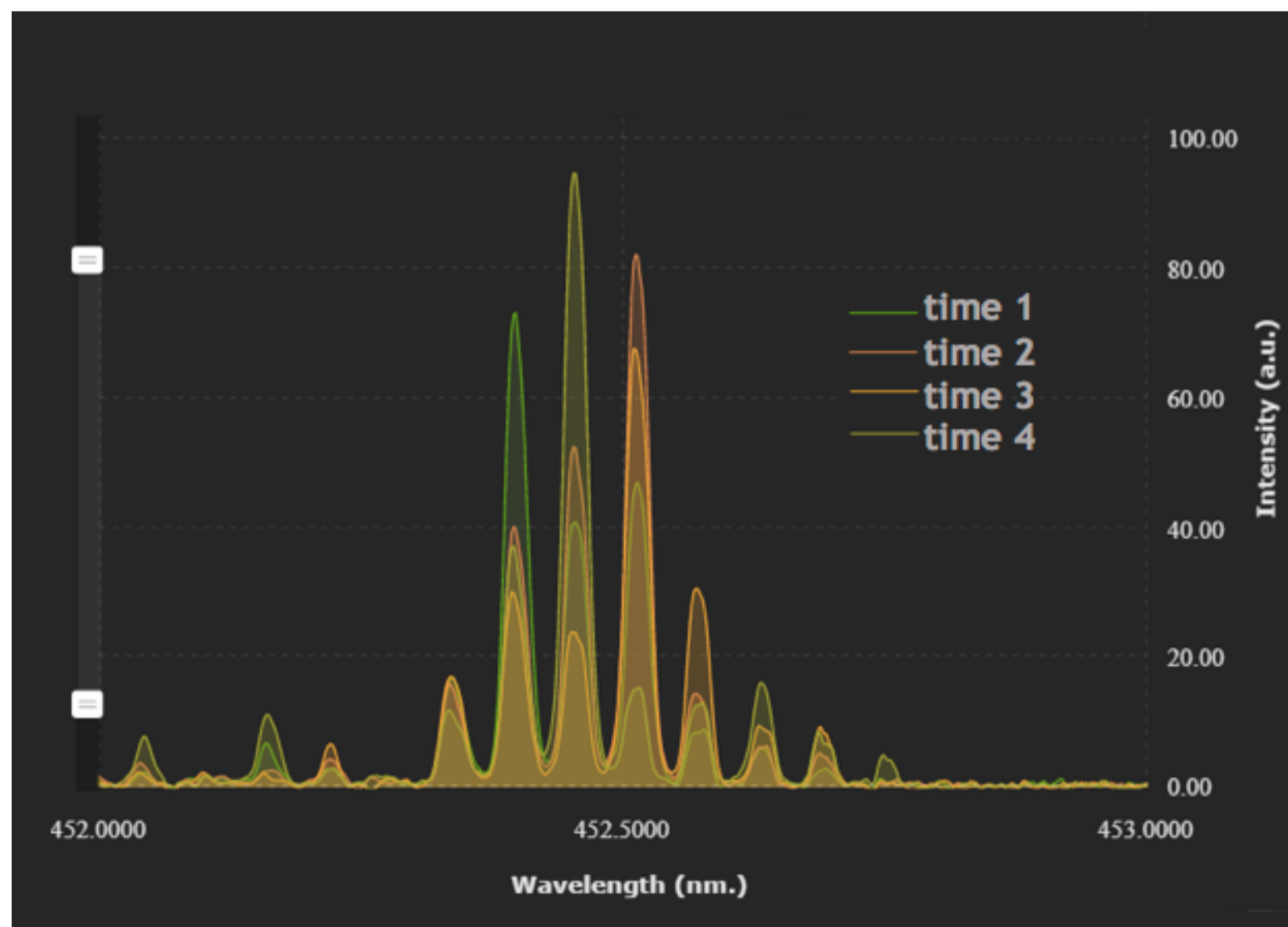
### High Finesse Etalon

The Engine of the Hornet Spectrometer is the high finesse etalon. Our patented fluid jet polishing technology allows us to create surfaces of unmatched parallelism and perfection. Imagine the resolution of a grating spectrometer in a device that fits in your hand, and with single shot acquisition covering the entire wavelength range.

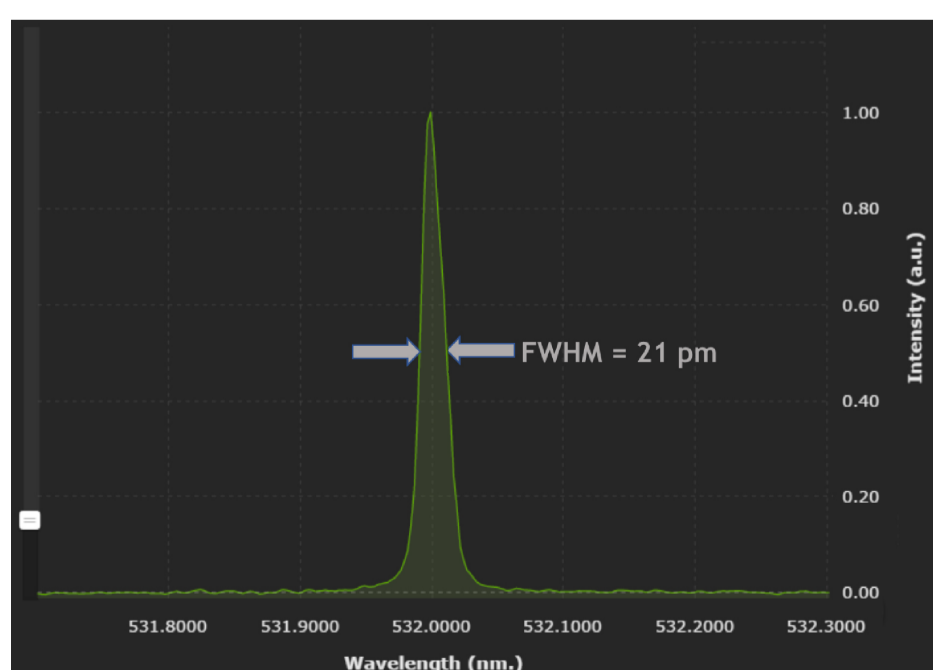
## Applications

### Light Source Measurements

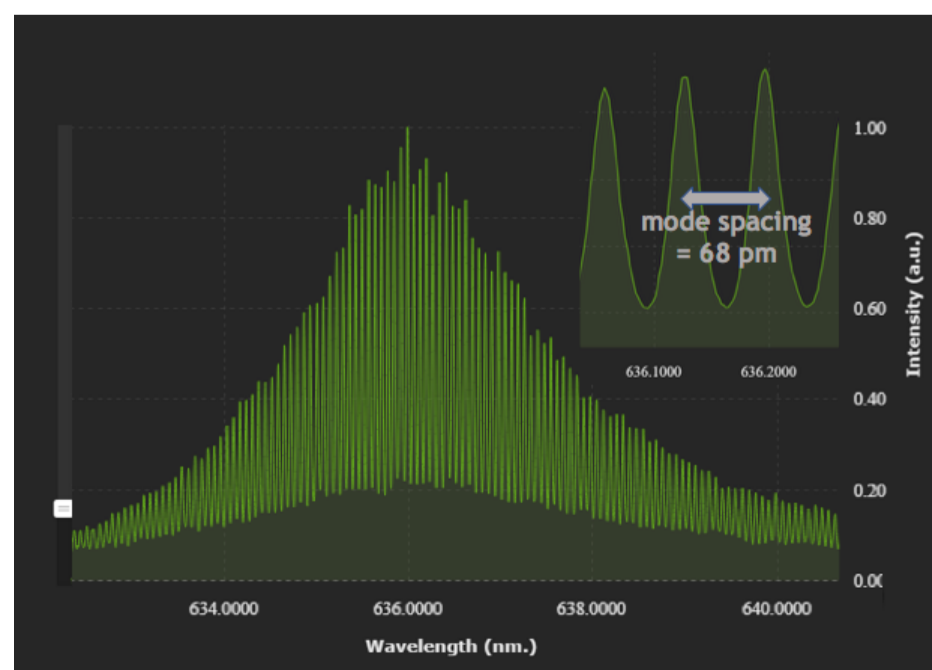
- Lasers of all types
- Superluminescent diodes
- Gas-discharge lamp, etc
- Spectroscopy



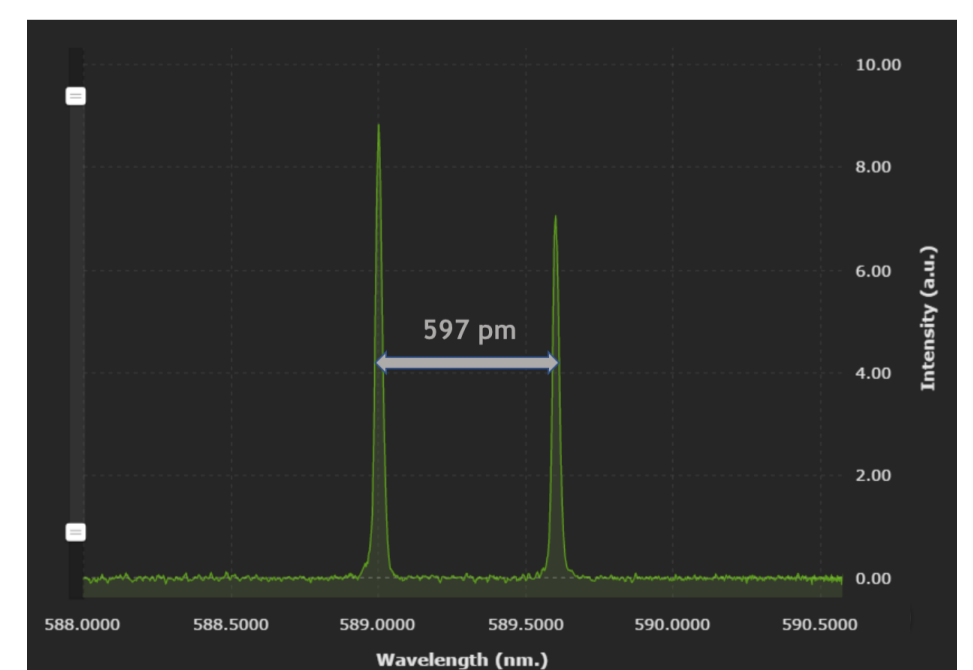
Laser diode: real time mode hopping monitoring



Second harmonic of a single longitudinal mode ytterbium-doped fiber laser



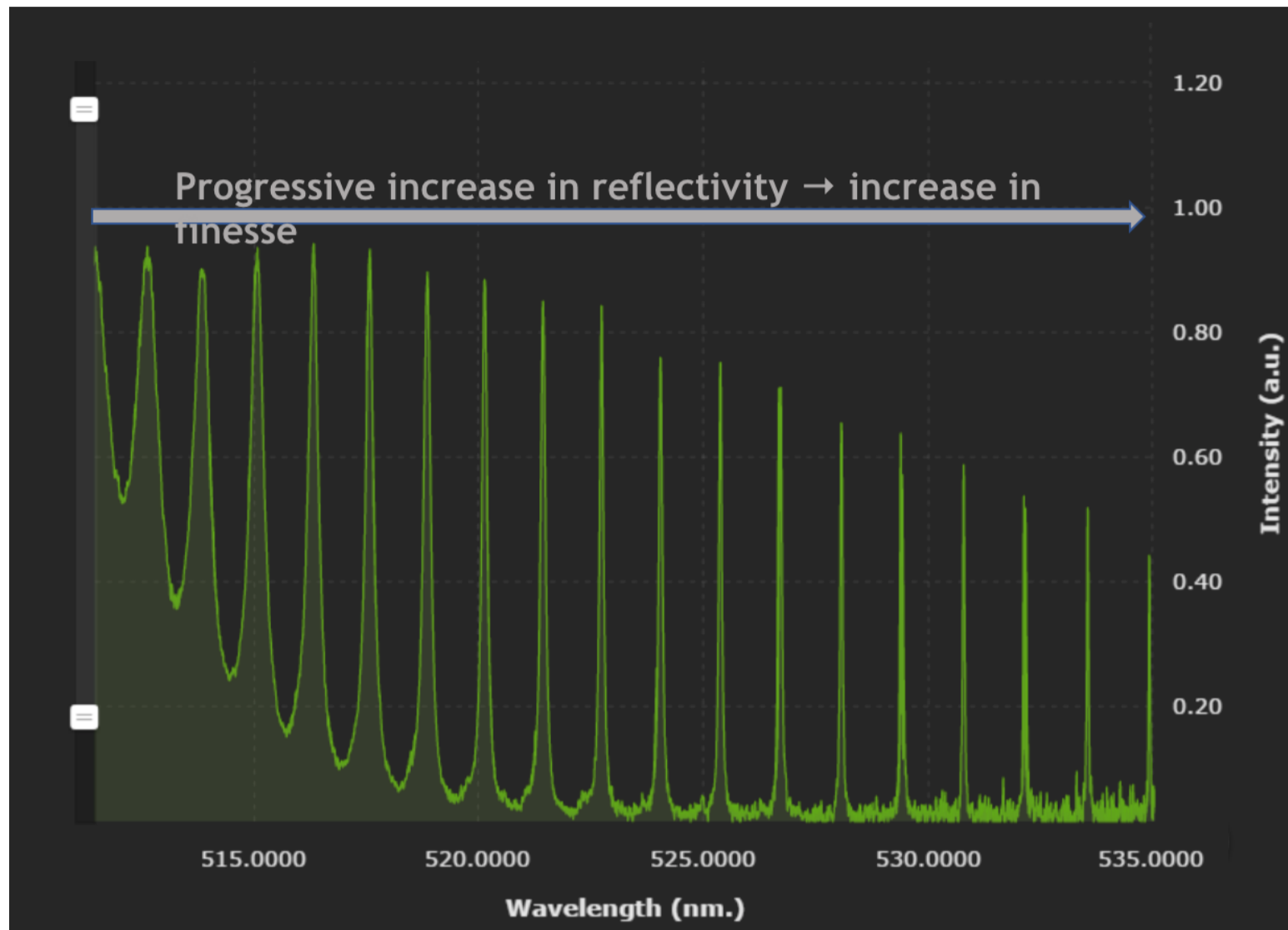
Fabry-Perot semiconductor laser diode just below the threshold



Sodium D-lines

## Passive components characterization and real time monitoring

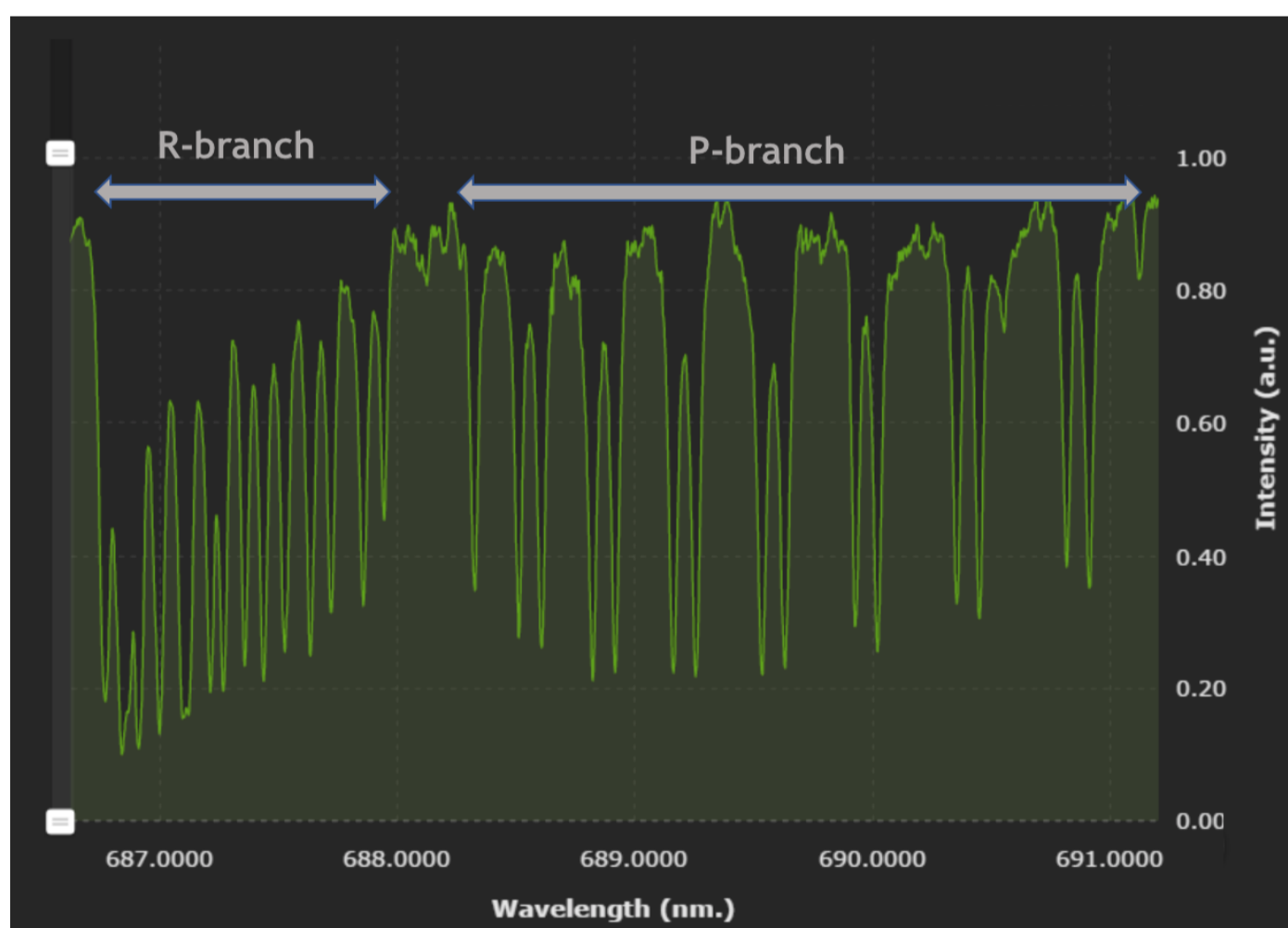
- Ultra narrow notch and bandpass filters
- Etalons
- Fiber Bragg gratings, etc



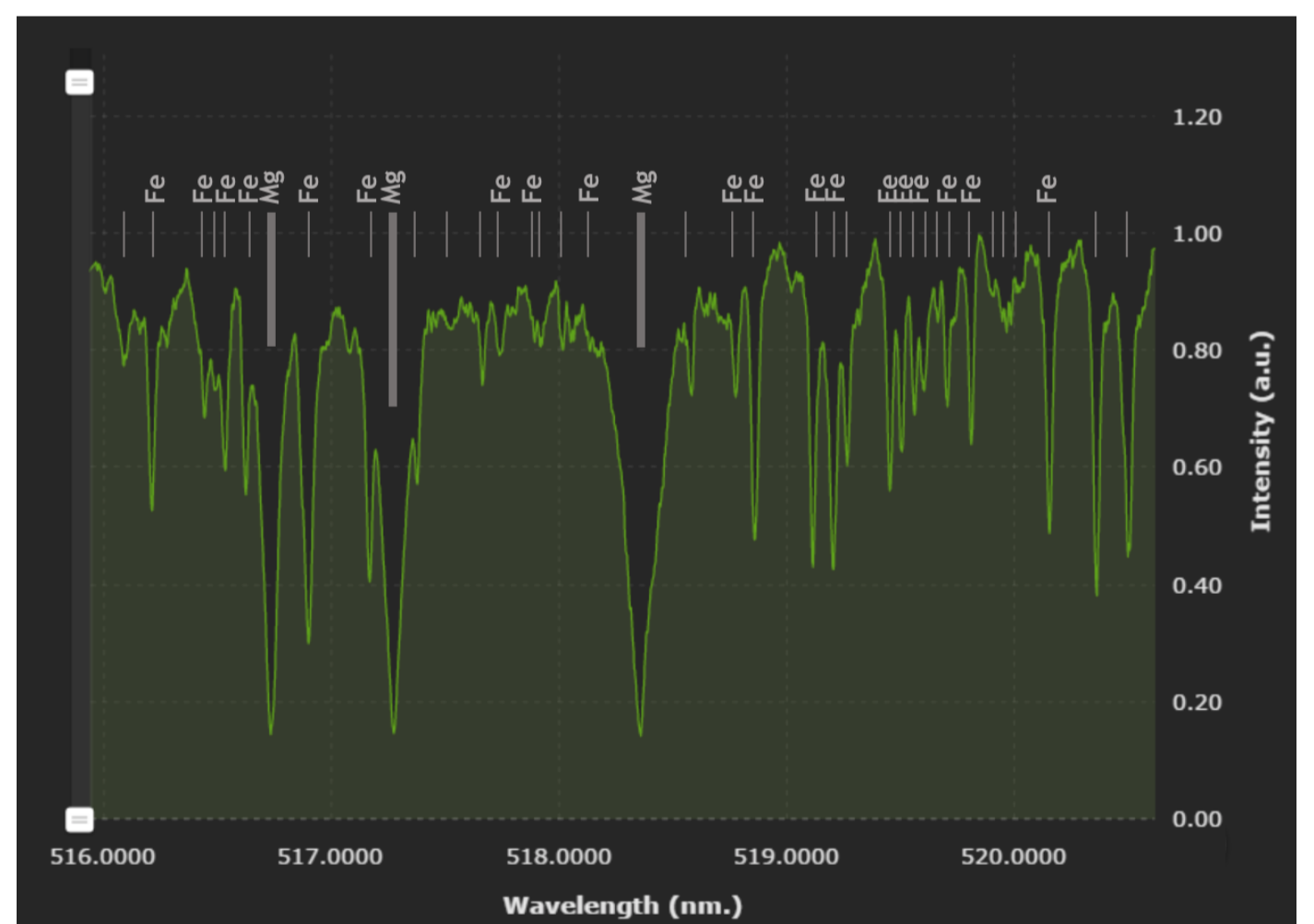
Transmission measurement of a 67  $\mu\text{m}$  thick etalon in a region of non-uniform reflectivity

## Solar spectroscopy

- Monitoring Earth's atmosphere
- Classic undergraduate and graduate experiments



Solar spectrum in a region dominated by the Mg triplet and multiple Fe absorption lines



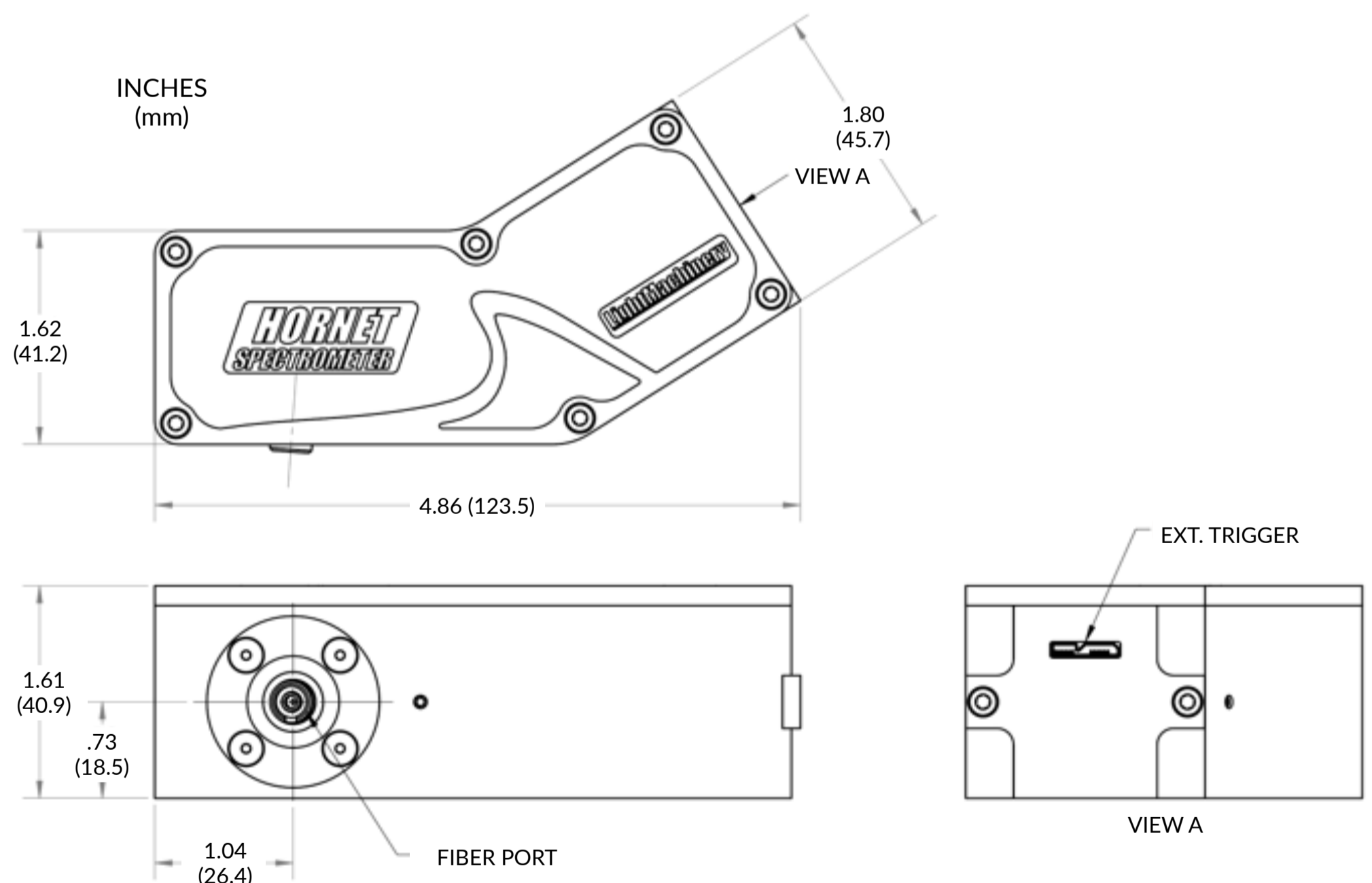
Solar spectrum in a region dominated by multiple O<sub>2</sub> absorption lines

## Models

Part Number	Spectral Region	Wavelength Range (nm)	Resolution (pm)
HN-9332	Visible	425 - 725	30
HN-9333	Visible	400 - 450	13
HN-9334	Visible	450 - 500	15
HN-9335	Visible	500 - 550	16
HN-9336	Visible	550 - 600	18
HN-9337	Visible	600 - 650	20
HN-9338	Visible	650-700	22
HN-9339	NIR	700-800	27
HN-9340	UV	260 - 300	15
HN-9350	IR	1025 - 1075	19
HN-9351	IR	1550 - 1600	21

## Specifications (HF-9332)

- Resolution: 20pm at 532nm (resolving power > 25,000), 10-30pm over the full range
- Accuracy: < 20pm following calibration
- Dynamic Range: >10<sup>8</sup> for the system, 4096 in a single measurement
- Wavelength range 425 - 725nm
- Calibration: an external reference source is required



For further technical and sales information, please visit our website or contact:

LightMachinery Inc.

80 Colonnade Road

Ottawa, Ontario, Canada, K2E 7L2

spectrometers@lightmachinery.com

(613) 749-4895