LIQUID CRYSTAL TUNABLE FILTER

Meadowlark Optics Liquid Crystal Tunable Filter

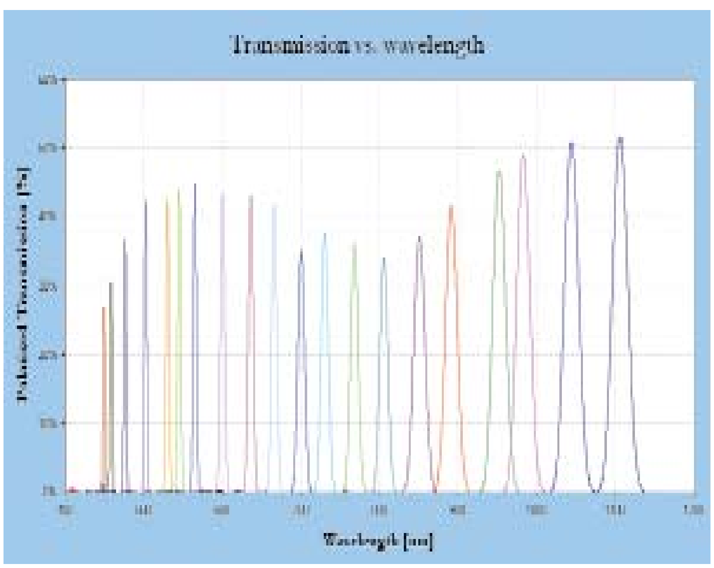
The Meadowlark Optics liquid crystal tunable filter facilitates spectral analysis of not only a collimated beam, but more importantly of an entire object. The tunable filter passes only a narrow bandwidth of light while blocking all others within the spectral range. The pass band can be shifted to a new color in the blink of an eye. This combination of pass band and speed is equivalent to thousands of dichroic or interference filters on hundreds of filter wheels. These advantages permit the user to acquire images at thousands of different wavelengths in a short amount of time.

The heart of the tunable filter consists of multiple liquid crystal variable retarders, invariant retarders, and polarizers all protected in a temperature-controlled housing. Varying the voltages applied to the liquid crystals shifts the pass band without any mechanical motion or vibration of the optics. Thus the filter can be tuned practically an infinite number of times since there is no wear and tear.

Extremely broad spectral ranges and high peak transmissions are achieved by using VersaLight polarizers and highly transmissive liquid crystal cells. A single VersaLight wire-grid polarizer functions from the near UV up through the NIR. VersaLight also has exceptionally high transmission across its spectral range.

Each liquid crystal cell that goes into the tunable filter has an exceedingly precise and uniform retardance. This is accomplished without the need to use spacer balls in the clear aperture, which can lead to localized color non-uniformities.

Exceptionally stable filter calibration is attained by controlling the temperature of the optics. The temperature is maintained well above ambient so that changes in the ambient temperature do not affect the temperature of the optics. The elevated temperature has the added bonus of increasing and maintaining switching speed of the liquid crystals.



meadowlark optics

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Specifications

Our tunable filters are fully customizable. Below are some examples of our filters.

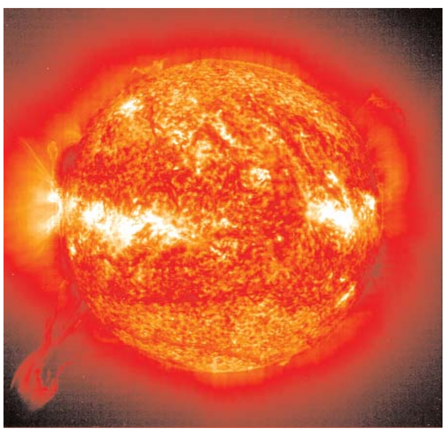
Description	Filter 1	Filter 2	Filter 3	Design ParameterSpace
Wavelength Range:	420 - 1000 nm	1071 - 1078 nm	900 - 1700 nm	350 - 2500 nm
Full Width at Half Max (FWHM):	5 nm @ 550 nm	0.2 nm @ 1075 nm	6 nm @ 1300 nm	0.1 to 100 nm
Polarized Peak Transmission:	5% to 30%	56%	10% to 40%	80% max, based on design
Tuning Resolution:	0.1 nm	0.001 nm	0.1 nm	~ 2% FWHM
Field of View (half cone angle):	7°	3°	3°	Based on design
Switching Speed:	< 100 msec	< 100 msec	< 100 msec	10 to 500 msec
Temperature Range:	10° C - 35° C	10° C - 35° C	10° C - 35° C	10° C - 35° C

Features:

- Broad spectral range
- High peak transmissions
- Uniform clear aperture
- No spacer balls in the clear aperture
- Calibration which does not vary with ambient temperature
- Wide field of view

Applications:

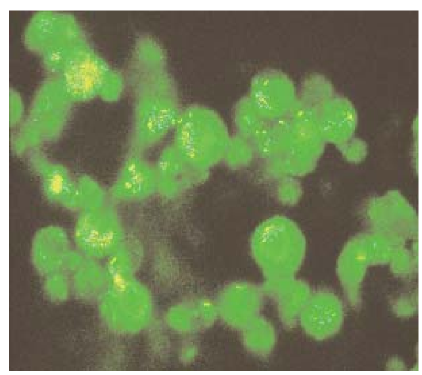
- Biological/Chemical Imaging
- Hyperspectral Imaging
- Pharmacological Development
- Solar Astronomy
- Fluorescence Microscopy
- Document Verification
- Remote Sensing



Solar Astronomy

Ordinary Illumination   Through filter

Document Verification



Fluorescence Microscopy

Liquid Crystal Tunable Filter Package Includes:

Optical Head
DB25 Optical Head Cable
D4020 Electronics Driver
USB and RS232 Cables (use either one)
Power Supply and Power Cable
Software
FilterDRIVE 4000
LabVIEW VI Drivers
HyperTerminal
User's Manual

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