

## AA.AOTF.nC-UV AO Tunable Filter

- 350 to 430 nm • Linear Polarization • Multi-lines/Laser

This solid-state AOTF is an electronically tunable bandpass filter for UV-Low VISible range. It uses the acousto-optic interaction inside an anisotropic medium (TeO<sub>2</sub>-S). It allows to select and transmit several wavelengths from an incoming laser source.

The main advantage of this technique is the total absence of any moving part which leads to a reliable, stable and fast technique for wavelength tuning. The RF frequency applied on the AOTF transducer controls the transmitted (filtered in 1st order) wavelength. A complete spectrum analysis can be done by varying the frequency corresponding to the wavelength range. The RF amplitude level applied on the transducer allows to adjust the transmitted (filtered) light intensity level. This is a unique feature that can provide the AOTF. It is fast (several  $\mu$ s), accurate and procures high extinction ratio.

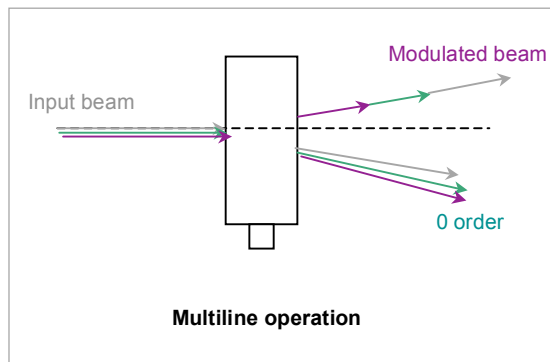
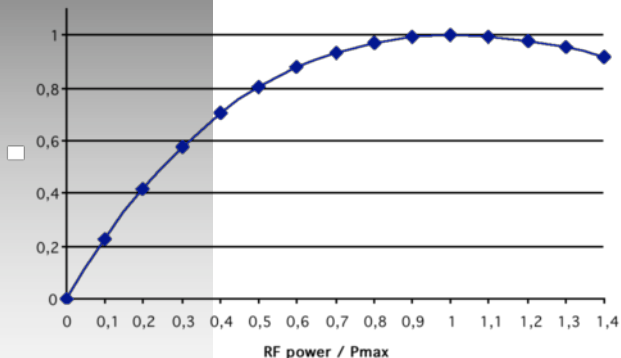
### Specifications

Material	TeO <sub>2</sub> [S]
Acoustic velocity	650 m/s
Optical Wavelength	350-430 nm
Number of laser lines	Up to 4
AO interaction type	Birefringent
Selected order	+ 1
Input Light polarization	Linear parallel
Output Light polarization (reference : base plate)	« +1 » order : vertical
Drive frequency range (F)	Nom 110-180 MHz
Active aperture	∅ 2 mm
Light beam size	≤ 1.5 mm
AO Light Frequency shift	« +1 » order : + F
Separation "0"-"+1" angle	≥ 4.2 degrees
Chromatic Colinearity	Optimized for «+1 order» 351+363 nm: < 0.2 mrd
Optical transmission	> 80 % (nom 90 %)
Temperature Stabilization	On request (T or TN)
AO efficiency in "1" order	≥ 90% @ PRF < 1Watt all lines
Access time / Response time	1.5 $\mu$ s / 1 mm
Max accepted RF Power	1 W
Electrical impedance	50 Ohms
VSWR	≤ 2/1 (Full bandwidth)
Size	70 x 36.6 x 35.8 mm <sup>3</sup>
Operating Temperature	10 to 40 °C

→ Associated RF driver: AA.MOD.nC-UV

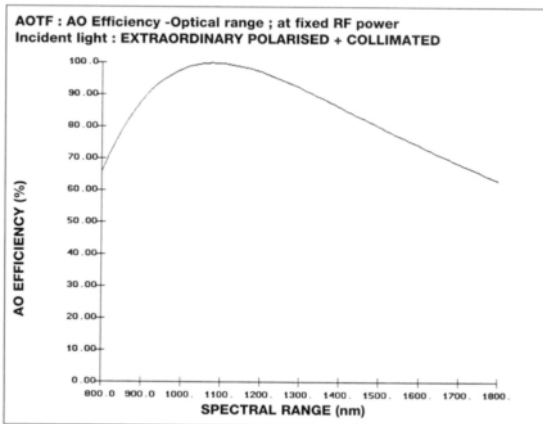
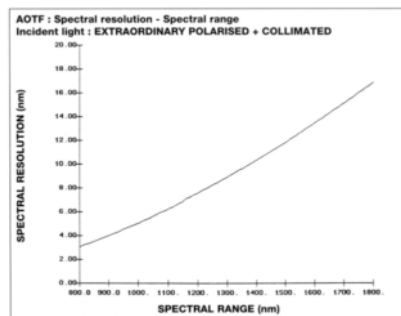
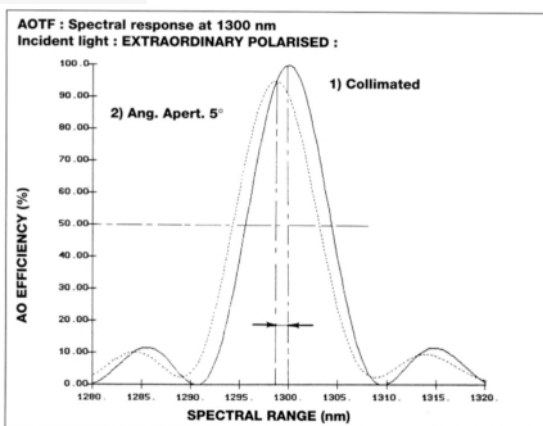
# Tunable Filter

Relative Diffraction Efficiency vs RF Power

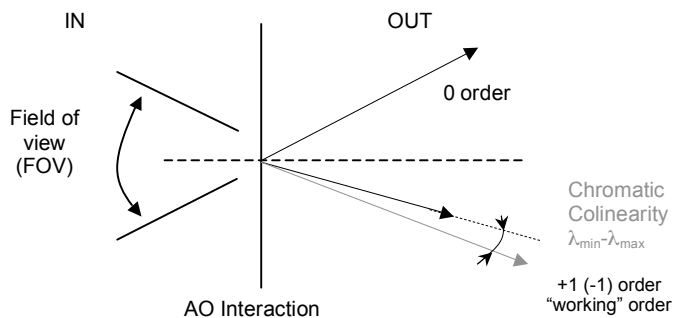


Spectral resolution (FWHM) of an AOTF varies with the square of the wavelength.

Efficient Side lobes can also be observed under certain conditions.



Example of efficiency behaviour of an AOTF, across wavelength range, at fixed RF power.



Chromatic colinearity in working order can be optimised with an adequate design.