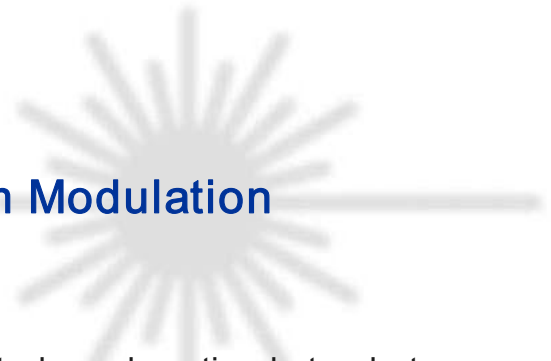


Brief introduction to Laser beam modulation

Many technologies exist for laser beam modulation and many laser beam parameters can be controlled (angle, intensity, phase, polarisation or a combination). Not everyone is aware of all available solutions. Acal BFi team of engineers is here to help you finding the solution that best fits your specific needs. The broad range of technologies available from us is giving us the opportunity to give a fair advice. The following charts are just a very brief overview of the most commonly considered parameters but many others (such as damage threshold, wavelength range, beam diameter...) have to be taken into account before selecting a technology. Thus do not hesitate to contact your local Acal BFi team for a more targeted recommendation.

Which parameters can I play on?

Technology	Intensity	Polarisation	Phase	Frequency (Optical)	Angular Deviation	Spectral Filtering	Q-Switch
Acousto-optic	Yes	No	No	Yes	Yes	Yes (AOTF)	Yes
Electro-optic (Pockels cell)	Yes	Yes	Yes	Yes (unusual)	Yes (unusual)	No	Yes
Galvanometers (Scanners)	No	No	No	No	No	Yes	No
Mechanical shutters, choppers	Yes	No	No	No	No	No	No
Liquid Crystals (Single & Multi element)	Yes	Yes	No	No	No	Yes	No
Polygons	No	No	No	No	Yes	No	No
Photo-Elastic Modulators	Yes	Yes	Yes	No	No	No	No



Brief introduction to Laser beam Modulation

Again, the following chart does not pretend to be exhaustive but only to help for a quick pre-selection. Numbers mentioned are orders of magnitude of best possible values, not all being achievable simultaneously. You can download more detailed specification sheets from our web site at <http://www.bfioptilas.com/> or feel free to call your local BFi OPTiLAS office to discuss your specific application with one of our engineers. Our team will be more than happy to assist you.

Brief Guiding Lines.....

Technology	Wavelength range	Modulation Bandwidth	Active Aperture (max)	Scan Angle	Rise Time
Acousto-optic	320nm-11µm	DC-50 MHz	2mm (visible)	0 - 4.4°	9 ns
		260MHz for shifters	6mm (infrared)		
Electro-optic (Pockels cell)	200nm-5µm	DC-200 MHz	50mm	NA	40 ps
		10GHz (resonant)	2 mm (resonant)		
Galvanometers (Scanners)	all	1.3KHz	50 mm	80°	0.3 ms response time
Mechanical shutters, choppers	all	0-500Hz (choppers:120KHz)	57 mm	NA	0.2 ms
Liquid Crystals (Single & Multi element)	400-700nm	0-20KHz	45 mm	NA	50 µs
Polygons	all	40 000rpm	30 mm	0 - 180°	NA
Photo-Elastic Modulators	170nm-19µm	100KHz (fixed)	30 mm	NA	NA

Acousto Optics
 Electro Optics
 Q-Switches
 Liquid Crystal
 Photo-elastic Modulators
 Shutters
 Choppers
 Galvanometers Scanners
 Polygons
 Scanheads