Polarizing Fibers and Polarizers

Operating Wavelength	Reference	20 dB Fast Edge (nm)	3dB Slow Edge (nm)	Extinction Ratio (dB)	Attenuation(dB/km)	MFD (µm)	Cladding Diameter (µm)	Coating Diameter (µm)
1550 nm	IXS-POL-1550-80	< 1500	> 1600	> 30	< 2	11 +/- 2.5	80 +/- 2	170 +/- 5
	IXS-POL-1550-125	< 1500	> 1600	> 30	< 2	11 +/- 2.5	125 +/- 2	245 +/- 15
1310 nm	IXS-POL-1310-80	< 1260	> 1360	> 30	< 2	9 +/- 2.5	80 +/- 2	170 +/- 5
1060 nm	IXS-POL-1060-125	< 1010	> 1110	> 30	< 5	7 +/- 2	125 +/- 2	245 +/- 15
840 nm	IXS-POL-840-80	< 790	> 890	> 30	< 5	6 +/- 2	80 +/- 2	170 +/- 5
780 nm	IXS-POL-780-80	< 730	> 830	> 30	< 5	6 +/- 2	80 +/- 2	170 +/- 5
	IXS-POL-780-125						125 +/- 2	245 +/- 15

Note: Polarizing fibers can be dispatched as rolled on a bobbin as standard fiber or coiled and deployed in the optimum conditions

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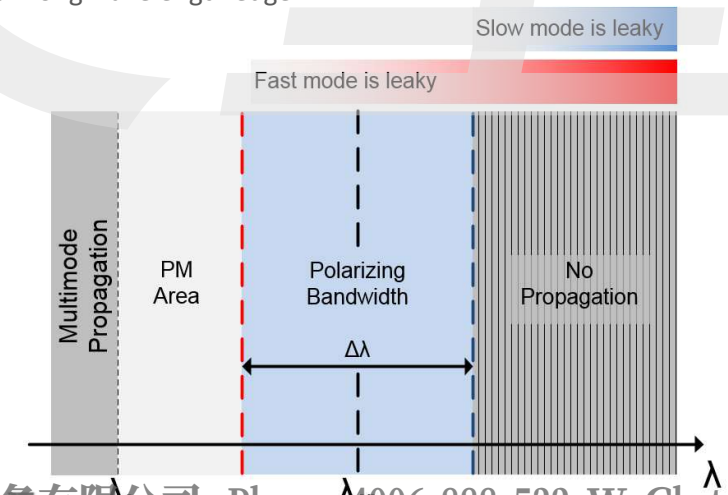
HOW IT WORKS

A Polarizing Fiber selectively attenuates the light propagating along one polarization axis (Fast Axis) and preserves only the polarized light along the other principal axis (Slow Axis).

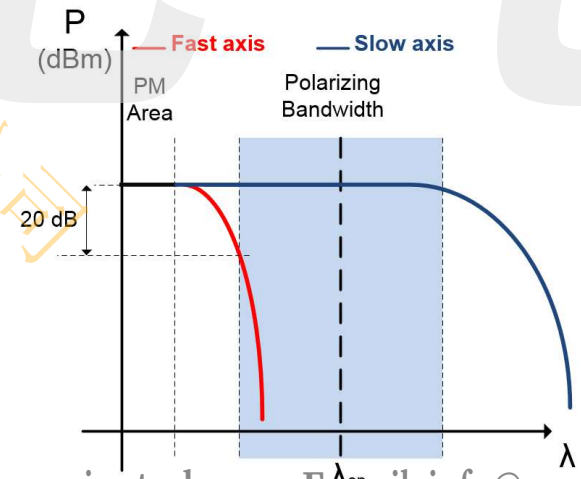
Design wavelength (λ_{op})
Wavelength at wich the fiber is typically used

Polarizing Bandwidth (Δλ)
> 20 dB short wavelength edge
< 3 dB long wavelength edge



Transmission spectra showing two separate cut-offs for the polarization modes in the fast and slow axes.

The concept of W-type fiber
+
Very High-Birefringence Fiber
=
Introduce separate HE_{11} mode cut-offs ine the fast and slow axes at different spectral positions λ_c^{fast}, λ_c^{slow} ($\lambda_c^{fast} < \lambda_c^{slow}$).



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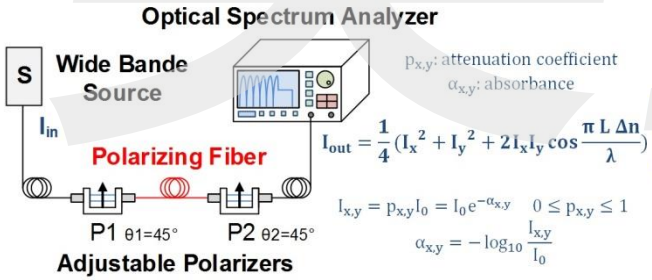
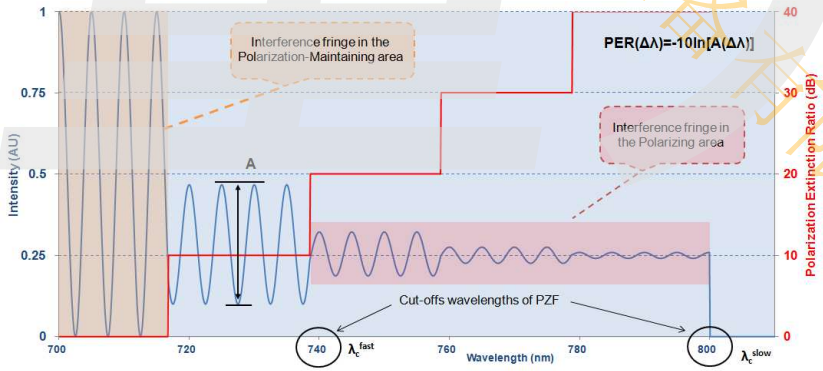
NEW FIXED ANALYZER METHOD (OR WAVELENGTH SCANNING)

Two polarization lights are interacted at the wavelength range under the cutoff-1 because two polarization modes can be propagated equally : perfect oscillation between 0 and 100% of the maximum signal intensity

At the fast axis mode leakage wavelength, the intensity should drop to 25% with a residual beat intensity directly linked to the quality of the polarizing fiber: its extinction.

The scheme for measurement for Polarization Extinction Ratio as a function of wavelength:





This method presents many advantages; not the least being that it yields rejection values in excess of the individual rejections of polarizers used for the setup.

Our fiber exhibits a PER in excess of 60 dB at the operating wavelength of 780 nm and has been used to upgrade a rubidium based 'cold-atoms' type experiment with unsurpassed power and polarization stability. Such a polarizing fiber will only unfold these unprecedented performances if the fiber is packaged and connector terminated by state of the art processes, both available at iXFiber.

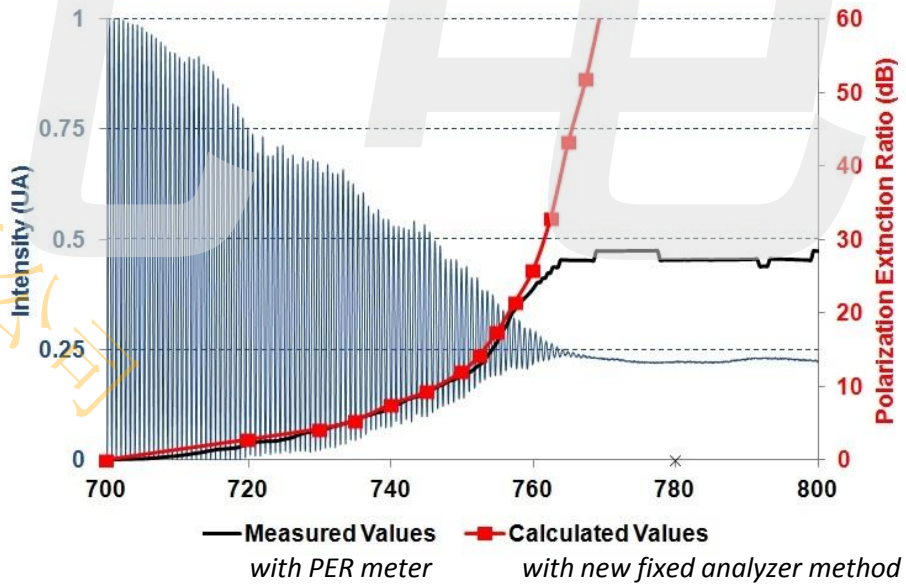


Figure. Measurement result and PER vs. wavelength.

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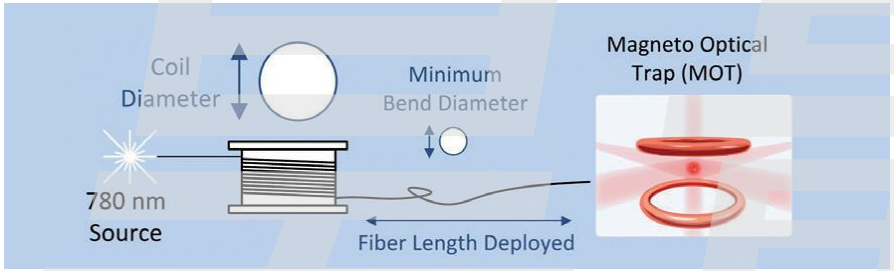
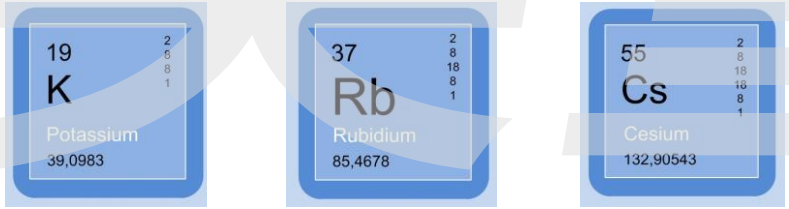
Wavelength 0.78 to 1.55 µm

POLARIZING OPTICAL FIBER FOR COLD ATOMS EXPERIMENTS :

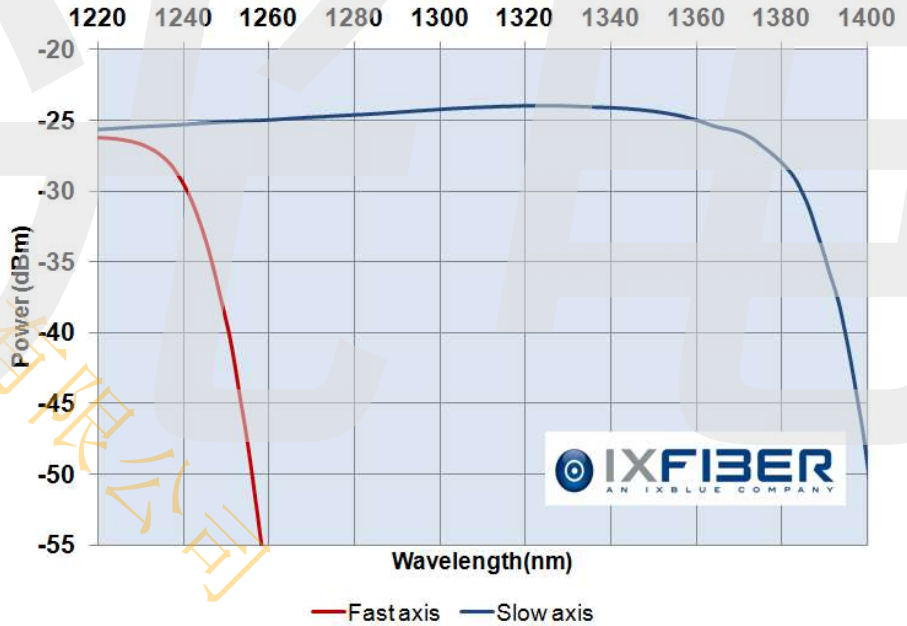




770 & 767 nm | 795 & 780 nm | 895 & 852 nm

Example : IXS-POL-780-125

COMPONENTS FOR FIBER OPTICS GYROSCOPES OR FIBER OPTICS CURRENT SENSORS:



Example : IXS-POL-1310-80

IN-LINE POLARIZER:

With or without connectors FC/APC or FC/APC Amagnetic (Titanium) are available (PER > 30 dB)