

ZPol

Radial Polarizer and “Z” Polarizer



**Radial Polarizer !
(Not a circular polarizer)**

Features

- Turns any linearly polarized laser to Radially polarized light
- Generates “Z” polarization
- Large aperture for most lasers
- High transmission

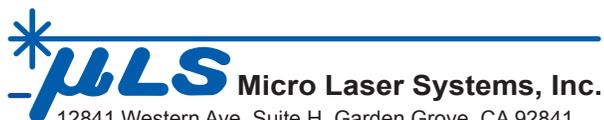
Manufactured by Nanophoton Corp.

The ZPol turns any linear polarized laser into Radial or Azimuthal polarized light. This Radial polarized light can in turn be made to generate Z Polarization, or polarization in the direction of light propagation.

Z Polarization is produced by a combination of ZPol and a high NA lens. The focal spot given by the lens has strong Z polarized light resulting from interference of radial polarization at the geometrical focus. In other words you have a strong longitudinal electric field that oscillates along the optical axis at the center of the focus spot.

With Azimuthal polarization a strong longitudinal magnetic field is observed that oscillates along the optical axis at the center of the focus spot.

Z polarization enables one to obtain 3D orientation of molecules and crystals.

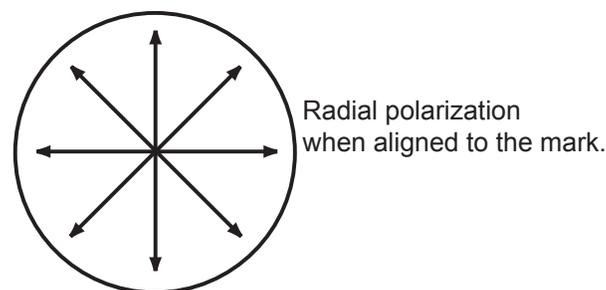


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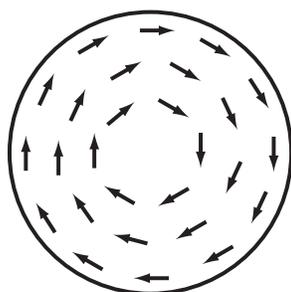
ZPol

Specifications

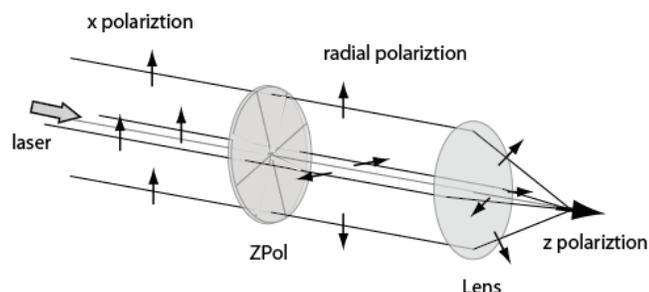
Size:	25mm dia. x 5mm thickness
Clear aperture:	10mm
Material:	Multi-order quartz waveplate
Pattern:	Four sections
Retardation error:	$0.5 \pm 0.05 \lambda$ as a waveplate
Optical axis error:	± 2 degrees
Group delay dispersion	$\sim 100\text{-}200 \text{ fs}^2$ $> 100\text{fs}$ negligible
Transmission:	$> 95\%$ typically



Azimuthal polarization when aligned 90 deg. to the mark.



"Z" Polarization



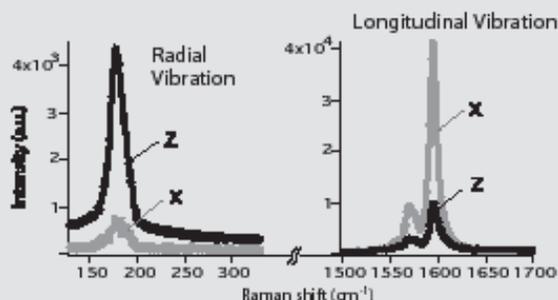
Ordering Information

Model #	Description
For low power lasers	
ZPol-532-QzM-4	For 532nm, $\pm 0.5\%$ bandwidth
ZPol-633-QzM-4	For 632nm, $\pm 0.5\%$ bandwidth
ZPol-785-QzM-4	For 785nm, $\pm 0.5\%$ bandwidth
For wavelengths between 450nm to 2000nm	
ZPol- λ -QzM-4	Specify λ . Bandwidth is $\pm 0.5\%$.
For High power lasers	
ZPol- λ -QzM-4H	Specify λ . Bandwidth is $\pm 0.5\%$.
For femto second high power lasers	
ZPol- λ -QzZ-4H	Specify λ . Bandwidth is $\pm 4\%$.

Example of Z polarization.

Raman scattering from carbon nanotubes was measured with x- and z-polarization. The radial breathing mode of the nanotubes is specifically detected by z-polarization.

Tip-enhanced Raman spectra of carbon nanotubes



The radial breathing mode is detected effectively with z-polarization. ZPol provides a new detection technique sensitive to molecular orientation in 3D.
Reference: Y. Saito et al., Chem. Phys. Lett. **410**, 136 (2005).

Courtesy from Nanophotonics lab, RIKEN, Japan

Specifications subject to change without notice.



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