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WHAT IS POLARIZATION AND WHY DOES IT MATTER?

Fiber optic systems used to rely simply on transmitting and receiving the power of light. But in addition to power, the optical field has other characteristics such as its wavelength, frequency, phase, and polarization. In particular, the polarization is the direction that the optical power is aligned perpendicular to the propagation direction of the light. Polarization is often exploited to carry more information and power down the fiber. For instance, the emergence of internet 2.0 and ubiquitous video and audio mobile phone service ignited explosive bandwidth demands. The optical telecom industry responded, using polarization to help increase the bandwidth.

Polarization: Why It Matters

As polarization becomes increasingly used in fiber optic products, accurate control and analysis of polarization is essential in building and evaluating the performance of optical components, fiber and systems. Optical fiber and components may (intentionally or more often unintentionally) be anisotropic. Optical instruments that precisely control and characterize polarization are used to measure these effects of optical anisotropy such polarization dependent loss (PDL) and PMD. Luna's suite of polarization control, measurement, and emulation test and measurement products help improve processes by gathering more actionable data in the field, lab, and assembly line. In addition to test and measurement, Luna's polarization expertise is available in sub-systems incorporated into products such as Optical Coherence Tomography (OCT) devices using low-coherence light to capture micrometer-resolution two- and three-dimensional images for healthcare; distributed birefringence and transversal stress in Optical Frequency Domain Reflectometry (OFDR) to clearly identify the locations and magnitudes of the stresses inside a fiber; in Light Detection And Ranging systems (LIDARs), which is a remote sensing method for mapping used in aerospace and self-driving car applications; and coherent beam combination that uses polarization and phase control to add optical fields together into very powerful optical sources.

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