Polarization State Scrambler Using Birefringent Phase Mask

Title: Polarization State Scrambler

Invention: A University of Arizona researcher has designed a device to efficiently convert partially polarized and polarized light into unpolarized light. The passive device provides almost instantaneous conversion of polarization, as opposed to the current methods which use a modulator that requires a signal generator and drive electronics. The novel device will be very useful for telecom, imaging, and illumination.

Background: In fiber optic communication systems, light signals are highly sensitive to polarization impairments such as polarization mode dispersion and polarization dependent loss. Lithium Niobate (LiNbO3) scramblers, which operate as a tunable waveplate that modulates the polarization state of light, are often utilized to mitigate some of the problems by converting a fixed incoming polarized light into random or pseudo-random polarized light at different times. In telecommunications, the scrambling rate should be faster than the inverse gain recovery time of the fiber amplifier. The scrambler should have low cost, low wavelength and temperature sensitivity and long lifetime.

Advantages:

* passive - no power required
* nearly instantaneous conversion of polarization
* easy to reproduce in high volumes

Applications:

* telecommunications
* imaging

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