

Linearly polarized light passes through a photoelastic modulator

Not all sources of light are polarized; for instance, light from an ordinary light bulb is not polarized. In addition to unpolarized light, there is partially polarized light and totally polarized light.

A photoelastic modulator (PEM) is an optical device used to modulate the polarization of a light source. The photoelastic effect is used to change the birefringence of the optical element in the photoelastic modulator. PEM was first invented by J. Badoz in the 1960s and originally called a "birefringence modulator." It was initially developed for physical measurements including optical rotary dispersion and Faraday rotation, polarimetry

If the optical element is relaxed, the light passes through with the polarization unchanged. If the optical element is stressed, the polarization components parallel or perpendicular ...

When the linearly polarized incident light passes through this optical element, the two orthogonal components of the incident light, one parallel and the other perpendicular to the PEM optical axis, ...

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The photoelastic modulators (PEMs) are polarization modulation devices. The PEM is typically used as the key component for generating modulated polarization states of light in an integrated instrument.

Photo-elastic modulators enable high sensitivity polarimetry via the high frequency ($f \sim 50$ kHz) modulation of the light polarization. The operation of the PEM is based on the photoelastic effect.

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