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Investigations on state of polarization in lightwave applications

ABSTRACT - Masterthesis

Light is an electromagnetic wave that holds both electric and magnetic field vectors with different vibrating directions. This wave when incident on a polarizing medium gets polarized in the direction of the polarizing axis and the corresponding state of polarization that is transmitted can be observed. Polarization of light can be observed during any of these situations: absorption, reflection, scattering or reflection. The state of polarization: linear, circular or elliptical, depends on the magnitude and phase angle of the electric field vector components. The state of polarization also changes due to the variations in azimuth and ellipticity angles.

Simulink is software which has a very wide range of applications. The system (SOP) is designed and modeled using Simulink. Different optical devices like wave plate, polarizer and Faraday rotator are used to design the model and obtain the optimized outputs. The results obtained due to different optical devices are compared and analyzed. Polarization measurements using rotating analyzer or rotating retarder when the analyzer is in a fixed position along with a photo detector is simulated and the photo current through the photo detector is observed.