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**NONLINEAR POLARIZATION CONTROL IN SILICON-ON-INSULATOR WAVEGUIDES**

# ***I.N.Strelnikov***

The most popular and robust optical element used to exercise control over the polarization state of a light beam is a linear polarizer. However, in many real-world applications, e.g., in telecommunications, such polarizers have limited use. The reason is that a linear polarizer transforms input beams with an essentially random distribution of polarizations into beams with a well- defined deterministic state of polarization (SOP) by wasting the orthogonal component. The overall 50% loss of energy inherent to his method can, in principle, be accepted. A much more serious problem is that, in the presence of signal polarization fluctuations and as a result of polarization dependent loss, outgoing beams acquire large intensity fluctuations. Thus, the interconnection with optical devices that postprocess these strongly fluctuating signals becomes problematic, especially if these devices are nonlinear. A need for polarization control methods free from polarization dependent losses comes to the forefront.

The main task at present is the design of the polarizer on the basis of silicon waveguides by analogy with the polarizers, discussed earlier in the quartz optical fibers. We formulated the equations of motion in terms of the Stokes parameters and solve these equations in one configuration: when the pump beam and signal beam propagate in one direction.

# The list of the publications

1. I.N. Strelnikov, V.V. Kozlov. NONLINEAR POLARIZATION CONTROL IN SILICON-ON-INSULATOR WAVEGUIDES // International Conference “Laser Optics” S.-Petersburg, 2012.