Diploma thesis abstract

Ghost imaging of two-dimensional polarising objects

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The master's thesis presents the results of experimental and theoretical studies formation of ghost images of polarization objects. It is shown that using the technique for reconstructing of ghost images, generalized to objects sensitive to polarization, it is possible to measure the angle of inclination of the axis of the "polarizer" object and the angle of rotation of the radiation polarization by the "rotator" object, in classical and quantum light. In the case of a thermal source, the object should be illuminated by unpolarized light with thermal statistics. The necessary source of radiation was collected, the width of the autocorrelation function is 30 μm, and the degree of depolarization is 92%. The polarization profile of the "polarizer" object was measured, by used this source, the accuracy of determining the angle of inclination is 8%, and the spatial resolution is 60 μm. The process of spontaneous parametric scattering by nonlinear crystals was used as a source of quantum light, it was shown that the radiation thus obtained can be used similarly to thermal radiation. At the same time, an experimental base was prepared for working in the nonclassical regime, a counter of single photons was developed and its main characteristic, quantum efficiency was measured, the obtained value is 27%.