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Analysis of statistical characteristics of the speckle structure, generated by scattered laser radiation from a rough optical surface

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Statistical characteristics of the field scattered by a controlled rough optical surface are investigated and expressions for the contrast of the speckle structure are determined depending on the degree of monochromaticity of the IR interferometer laser radiation. The results of experimental studies of a mock-up sample of a laser IR interferometer constructed according to a modified Twyman–Green functional scheme with an operating wavelength of radiation $\lambda = 10.6$ microns are presented and recommendations on the choice of its element base are formulated.

Keywords: large-sized and rough optical surfaces, phase screen model, speckle structure, contrast of interference rings, coherence of laser radiation, scattering of laser radiation.

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