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# The analysis of the influence of limiting factors in the method of differential scattering in the control of surface inhomogeneities of the subnanometer level of the profiles of optical parts

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***To achieve high technological quality indicators of various optical parts of a new generation, not only a modern approach to the methods and means of processing parts is necessary, but also the implementation of promising high-precision non-contact diagnostic methods. Particular attention in a single technological chain is occupied by the stages of deep polishing, when the height statistical parameters of the profiles reach nano- and sub-nanometer levels. To diagnose high-altitude statistical parameters of the subnanometer level, various classes of optoelectronic devices and systems are currently used. Of greatest interest in the problems of high-precision certification control are such promising devices and systems as: dynamic interferometers, as well as devices that allow estimating the root-mean-square value of surface inhomogeneities of the subnanometer level according to the analysis of the scattered laser radiation indicatrix. In world practice, methods based on the analysis of the indicatrices of scattered laser radiation are classified into [1–7]: methods of total integral scattering (TIS-Total Integrated Scattering), methods for determining the distribution function of the reflection coefficient in two angular coordinates (method for determining the characteristic BRDF - Bidirectional Reflectance Distribution Function), differential scattering methods (ARS–Angle-Resolved Scattering). Analysis of the influence of limiting factors in the differential scattering method makes it possible to determine its systematic error by increasing the measurement accuracy.***

*Keywords:* optical control, differential scattering method, scattering indicatrix, scattering coefficient in two angular coordinates, surface irregularities.

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