

## THE SPATIAL DISTRIBUTION OF LASER RADIATION REFLECTED BY A ROUGH SURFACE

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In this paper performed analysis of the work process of the system with ellipsoidal reflectors which is used for investigation of rough metal surface [1]. Registered scattering spot (Fig.1.a and Fig.1.b) contains characteristic areas, which analysis allows to determine roughness type (directed or non-directed), and the relative brightness distribution in separate areas (Fig.1.c and Fig.1.d.) is a prerequisite for the determination of roughness value.

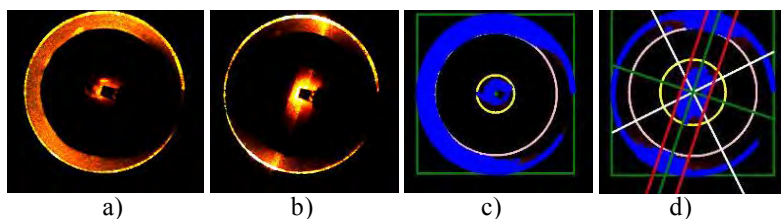


Fig.1 – Distribution of brightness for samples: a) cast iron with Rz 250 after processing in tumbling drum; b) steel with Ra 8.23 after processing by cylindrical milling; Fig. c) and d) illustrates the fragmentation of the image for analysis

Photometric system constructed on the base of microscope MBS-10. The major problems arising in the manufacturing and assembling processes of the system related to the accuracy of basing the main details of construction. Particularly meet high requirements for coaxiality of ellipsoidal reflector with projector system, which role performed by Galileo systems and ocular of microscope. Also, it should provide high quality of the aluminum ellipsoidal mirror surface. Parameters of the probe laser transmitter must be matched to the characteristics of CCD camera and type (material) of investigated the metal sample.

For the assembling of the photometric system with ellipsoidal reflectors has been developed algorithm, which allows to take into account the possible instrumental errors. By using a mathematical model is planned to provide processing of the results and determine the significance of the data was taken into account, depending on the accuracy.

### References

1. Bezuglyi, M.A., Botvinovskii, D.V., Zubarev V.V., Kotsur Y.A., 27, "Method of photometric mirror ellipsoid of revolution for research of roughness of surface," Methods and devices of control of quality, 77-83 (2011).