

# Journal of Optical Technology

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## A monolithic spectrograph with a transmissive holographic diffraction grating

[É. R. Muslimov](#) » [View Author Affiliations](#)

Journal of Optical Technology, Vol. 81, Issue 3, pp. 154-158 (2014)

<http://dx.doi.org/10.1364/JOT.81.000154>

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### Abstract

This paper proposes an optical layout for a monolithic spectrograph with a transmissive holographic diffraction grating. All the elements of such a layout are located on the surface of a single block of transparent material. Such an approach allows the design of the device to be simple and reliable and makes it possible to increase its aperture and to introduce additional correction of the aberrations. The use of a transmissive holographic grating in such a layout makes it possible to reduce the size of the layout, to increase its stability against external effects, to couple it with other optical systems, and to achieve high diffraction efficiency. The technique for designing the optical layout consists of determining its starting configuration from the conditions for correcting the main aberrations of a grating on a plane, followed by numerical optimization. The layout of a spectrograph for the 450–900-nm range is given as an example. The achievable image quality is demonstrated, and ways are presented to implement the proposed grating.

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### OCIS Codes

[\(090.2890\)](#) Holography : Holographic optical elements

[\(230.1950\)](#) Optical devices : Diffraction gratings

[\(300.6190\)](#) Spectroscopy : Spectrometers

### History

Original Manuscript: May 21, 2013

Published: April 21, 2014

### Citation

É. R. Muslimov, "A monolithic spectrograph with a transmissive holographic diffraction grating," J. Opt. Technol. **81**, 154-158 (2014)

<http://www.opticsinfobase.org/jot/abstract.cfm?URI=jot-81-3-154>

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