
6th Asia-Pacific conference Fundamental Problems of Opto- and Microelectronics

Harbin, China

September 12 - 14, 2006

















Asia-Pacific conference

Fundamental Problems of Opto-and Microelectronics

Harbin, China September 12-14, 2006.

Welcome to

6th Asia-Pacific Conference 'Fundamental Problems of Opto- and Microelectronics' (APCOM2006)

2nd International Forum for Development and Industrialization of Optical Fiber Sensor (IFDI-OFS2006)







Krokhin Oleg, Academician





Computer Holography by means of the Laser Diodes

Abstract

1. Introduction

2. Theory

3. Experiment

4. Results

5. Conclusion



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Computer Holography by means of the Laser Diodes

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Computer holography

- A computer holography is the optical hologram recording on the CCD-matrix with digital reconstruction of the 2D-images for the different values of λ and θ .
- The possibility to use compact semiconductor laser diodes in the computer holography for 3D-image registration is experimentally proved in the S. Benton's scheme.
- For 2D case hologram recording the S. Benton's scheme for holography using is suggested.

The experimental setup with Laser Diode

The diagram shows a laser diode, a lens, a CCD-matrix, and a screen. The photograph shows the physical setup in a laboratory.

Laser Diode

The diagram shows a laser diode with its electrical connections and a small schematic of its internal structure.

Hologram recording

The diagram illustrates the recording of a hologram on a CCD-matrix, showing the incident light, the object, and the recording plane.

Hologram reconstruction

The diagram illustrates the reconstruction of a hologram, showing the reconstruction light, the hologram, and the reconstructed image.

Reconstructed 2D image plane

The images show the reconstructed 2D image plane for different wavelengths, demonstrating the color dispersion of the reconstruction.

Hologram file

The images show the hologram file as a grayscale pattern and as a color pattern, illustrating the digital representation of the hologram.

S. Benton's Computer holography

The diagram shows the experimental setup for S. Benton's computer holography, and the photograph shows the physical setup.

Rainbow hologram file

The image shows a rainbow hologram file, which is a digital representation of a rainbow hologram.

Conclusions

The possibility to use compact semiconductor laser diodes in the computer holography for 3D-image registration is experimentally proved in the S. Benton's scheme. For 2D case hologram recording the S. Benton's scheme for holography using is suggested.

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Thank you!



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