

# A Device for Detection of Bacterial Cells

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**Abstract** – A device for detection of bacterial cells and results of researches bacterial cells of *Escherichia coli* and *Desulfoomonas acetoxidans* is described.

**Keywords** – device, bacterial cells, detection.

## I. INTRODUCTION

Monitoring of bacterial cell numbers is of great importance not only in microbiological industry but also for control of liquids contamination in the food and pharmaceutical industries. A new device for registration of bacterial cells in liquid medium after the changes of their size distributing is described. Procedure of registration of bacterial cells consists in dissociating of signal from noises, amplitude and duration measurement of the proper electric impulses. The observed in real-time of particles imaging the screening on monitor of the personal computer. The developed software allows estimating the size distributing of the explored objects and their concentration in a liquid medium in 3D-imaging. There possibilities of device from registration and visualization of bacterial cells of different nature are presented [1, 2].

## II. STRUCTURE AND REALIZATION

The device consists of three basic operational units: an optical block, electronic block, instrumentation calculable block. The main functions of the optical unit consists in forming of the counting volume of the zone of the bacterial cells registration, collection of light scattered by the cells and its transmission to the photodetector of the device. The electronic of device executes all base functions of the operating working of informative signals of optical block a device: strengthening, normalization, analog-digital transformation, digital filtration and programmatic analysis of measuring results, communication of data in the personal computer. Except for the indicated base operations this block will be realized by the row of service functions:

- autodiagnosics of capacity of own electronic vehicle resources;
- diagnostics of good condition of knots of optical block ;
- configuration of measuring chart is in obedience to the chosen algorithm of work;
- calibration of analog highways of the measuring system ;
- adaptive program-driven measuring of parameters of the set types of bacterial cells;
- previous digital treatment of measuring results;
- formation in the process of registration of additional statistical and official information, which can be used for

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- the subsequent analysis of data on the personal computer;
- comparison of signals of particles is on a supporting channel and measuring channel;
- filtration of signal of particle;
- record of parameters of signal of particle is in the file of results of treatment.

The process of measuring presents by itself measuring-calculable procedure in the process of which the series of optical parameters of standard and explored dispersion mediums is carried out, and also metrological performance of electronics. Measuring is carried out in the mode of the real time and screening on monitor of the personal computer. The developed software allows in the process of measuring to estimate the size distributing of the explored objects and their concentration in a liquid medium in 3D-imaging, and also to compare the got picture of three-dimensional visualization of result with the 3D-images of standard text mediums (fig.1).

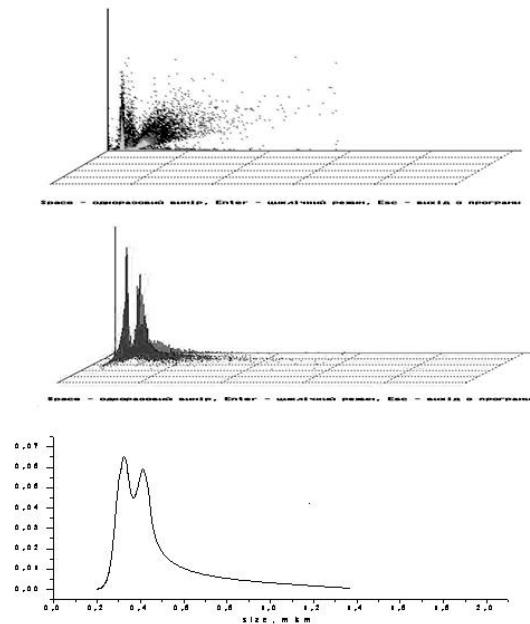


Fig.1. Example of graphic visualization of the size distributing of particles in the process of measuring.

## III. CONCLUSION

A device for registration of bacterial cells in liquid medium after the changes of their size distributing is described. Distribution of particles by sizes is determined from the measured functional dependence of number of registered particles from amplitude and duration of the proper electric impulses by the output photodetector.

## REFERENCES

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