

## UNIVERSALIZATION OF LASER DOPPLER FLOWMETER'S SENSORS

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Doppler flowmeters is the technical tools to measure linear speed and in biomedicine are used to determine blood flow for assess the state of the circulatory system. Due on possibility of laser flowmeter, marked functional limitations related to use multiple sensors designs for assessing the hemodynamics of blood vessels located in different parts of body. In this paper is considering possibility of create a universal design of the sensor laser Doppler flowmeter that will simplify the process of research.

Laser Doppler biomedical flowmeters as the probing signal use the optical radiation. The key parameter is the penetration depth of optical radiation, which allows ensuring proper diagnostics. Also need achieve the high measurement accuracy with a correction of depth studies. From these parameters depend size and number of sensors. Most types of sensors used in laser Doppler flowmeters differ in structure and scope, but the principle of their work is in most cases identical. Possible design with two probing beams, in this case uses two sensors, which provide receive and transmission of signal.

Construction of sensors are selected and determined depending on position of blood vessels for researching which they are intended. The paper analyzed the types of sensors laser flow for invasive and noninvasive diagnosis.

Considered types of sensors in terms of registration light principles and models of optical radiation propagation, which use optical identification, are completely different. Therefore, the author proposed scheme-technical solution design universal sensor based on laser flowmeter [1] and ellipsoidal photometry [2] that due to variable of sensor size and one measuring principle significantly simplifies the construction flowmeter with enhanced functionality. Also mechanism connection and quick-change additional sensors without special tools for monitoring of speed microcirculation motion in different parts of body are unified.

### References

1. Безуглый М. А. Применение эффекта Допплера в оптической биомедицинской диагностике / Безуглый М. А., Коцур Я. А. // Вісник НТУУ «КПІ». Приладобудування : збірник наукових праць. – 2011. – Вип. 42. – С. 177–184.
2. M. A. Bezuglyi, N. V. Pavlovets, “Optical biometry of biological tissues by ellipsoidal reflectors”, Proc. OSA-SPIE 8798, 2013.