

СЕКЦИЯ 4. ЛАЗЕРНАЯ ТЕХНИКА И ТЕХНОЛОГИИ

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THE SPATIAL LIGHT SCATTERING BY HUMAN BRAIN TISSUES

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Despite the significant progress in optics of biological tissues (BT), the issue of light distribution in the BT remains insufficiently researched, in particular the spatial scattering of light. This work is a continuation of a series of experiments about researches of spatial scattering of laser radiation by biological tissues [1, 2].

In this work was simulated the indicatrix of scattering for human brain tissues at different wavelengths. The modeling of the propagation of optical radiation was obtained by Monte Carlo simulation. The thickness of the samples varied from 0.01 mm to 2.5 mm. For each model experiment, 20 million photons were launched, on the number of which the received graphs were normalized. As example, indicatrices of scattering by white brain tissues for a thickness of 1 mm at wavelengths of 405, 532, 650 nm are shown in fig. 1.

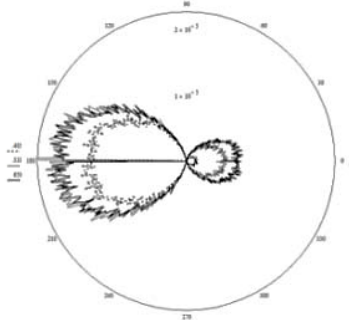


Fig. 1. Normalized light scattering indicatrices

From the graphs, can conclude that the spatial scattering of radiation at wavelengths of 532 nm and 650 nm is the same, and at a wavelength 405 nm – significantly different.

References

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2. N. V. Bezuglaya, M. A. Bezuglyi, G. S. Tymchik, “Features of anisotropy of light scattering on fibrous biological tissues”, Bulletin of NTUU “KPI”. Series instrument making, 50 (1), 169-175 (2015) [In Ukrainian].