Wideband focused array transducer for optoacoustic tomography

Diploma thesis abstract

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A method for calculation of the parameters of wideband focused array transducer from the required image resolution in optoacoustic tomography has been developed.

Several sets of array transducer parameters for various problems of optoacoustic tomography have been calculated using the developed method. Maps of the transducers focal area have been numerically calculated for the obtained parameters. Resolution in direction perpendicular to the image plane and length of the imaging window has been estimated from the maps. Good agreement between the required and obtained parameters demonstrates the adequacy of proposed method.

8-element transducer for optoacoustic tomography of biological objects has been developed. The transducer consists of the set of the linear PVDF piezoelectric films located on a plane and focused by an acoustic lens.

Map of transducer focal area has been experimentally measured. Good agreement between the required and obtained resolutions and imaging window lengths demonstrates the adequacy of proposed method.

Image of a focused point source has been plotted based on experimentally obtained signals. Conclusion of numerically calculated and experimentally measured images correspondence and developed method correctness has been done.