

An Approach to Biochemical Imaging of Heterogeneity in the Bio-tissue Simultaneously Using the Data of Reflectance and Transmittance of Diffuse-Photon Density Waves

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Abstract: An algorithm for the biochemical imaging of heterogeneity in the bio-tissue with finite parallel-plane geometry simultaneously using the data of reflectance and transmittance of diffuse-photon density waves is presented. In this algorithm, the priori knowledge of heterogeneity is not needed. This algorithm is suitable for the imaging of heterogeneity in the large volume tissue and in small organs. To reduce the errors produced by the algorithm, it is suggested that the experiment should be performed in two steps, at first step the light source should be placed at one boundary to measure the data of reflectance and transmittance, and these data are used to construct the heterogeneous function in the half space close to the light source; at the second step the light source should be placed at another boundary to measure the data of reflectance and transmittance, these data are used to construct the heterogeneous function in another half space closed to the light source; after taking above two steps the heterogeneous function in the whole space is constructed.

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Key words: biochemical imaging, reflectance, transmittance, diffuse-photon density wave

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