Differential method in the diffuse optical tomography

Abstract

We analyze the probability of application the differential method of visualization of the inner structure in strongly dispersive objects in the diffuse optical tomography (DOT) in the research theses. Therefore, the earlier existent programme for the experimental setup of diffuse optical tomograph was modified. The errors of the image restoration of opaque inclusion against the moving off the center of the object are found. And the errors' values of used approximate algorithm of solution the direct and inverse problems are also found. It was verified the applicability of the differential method of visualization of the inner structure in the experiments for strongly dispersive (μ_s'=1,4 mm^{-1}) model object 160 mm in diameter with strongly and weakly absorbing inclusion (μ_a>0,003 mm^{-1}, diameters ~ 10 - 60 мм). The applicability of rapid algorithm of solution the direct problem DOT for weakly absorbing inclusions is investigated. It is also investigated the comparison the accuracy of the differential method of visualization of the inner structure of DOT with the accuracy of earlier existent method.