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**A FUZZY MODEL OF OPTICAL DENSITY INTERVAL  
OF ORIGINALS AND REPRODUCTIONS**

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***Research methodology.*** *The methodological base of the research is the basis of tone reproduction of images related to the technological transformation of originals and reproductions. To solve this problem we have applied the theory of signals and images for grey scale analysis, the theory of fuzzy sets for building a fuzzy model of tone reproduction, the theory of modelling for graphic interpretation of a fuzzy model, object-oriented programming in Simulink package for processing a simulator of a fuzzy model of intervals of optical densities, calculating the membership functions and their visualization.*

***Results.*** *In the conducted study, we have processed a fuzzy model of intervals of optical density of originals and reproductions for gray scale simulation associated with technological changes in the offset printing. We have developed a simulator of membership functions of a fuzzy model that simultaneously calculates three functions of a fuzzy model and makes their visualization. The results of simulation modelling as graphs of membership functions of fuzzy sets have been presented. We have found out that fuzzy models numerically, so objectively evaluate the tone reproduction which is an advantage of fuzzy models.*

***Novelty.*** *Scientific novelty of the results is that the membership functions of fuzzy sets for optical density intervals have been defined when reproducing a grey scale associated with technological changes in the offset printing that quantitatively assess the tone reproduction, which is an advantage of fuzzy models over the traditional ones.*

***Practical significance.*** *The processed fuzzy models and simulator can be used to determine the membership functions of fuzzy models and quantify the tone reproduction that can be considered when organizing the tone reproductions, including the combination of density intervals of an original and a bitmap print.*