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**SENSITIVITY OF TONE REPRODUCTION OF SHORT INK PRINTING
SYSTEMS OF PARALLEL STRUCTURE**

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***Research methodology.*** *The methodological base of the research makes the material balance principle of ink flows in the printing system. To solve this problem the theory of signals have been applied to analyze the ink flow modulated by raster printing plates, a graph to describe the structure and modulated ink flows, the theory to determine the sensitivity of tone reproduction to variations in the system parameters.*

***Results.*** *In the conducted study the mathematical model of ink flows transfer modulated by a raster printing plate on the basis of which the functions of the sensitivity of tone reproduction with variations in the system parameters have been defined. The graph of the system has been designed on the basis of which an analytical dependence of tone reproduction has been set expressed by an average of the thickness of modulated ink flow at variations in the relative area of raster elements of linear test scale. The results of simulation modelling as tone reproduction characteristics and sensitivity characteristics of the system have been presented. It has been found out that the printing system is quite sensitive to changes in the area of raster elements, depending on the range of tone reproduction. The work has practical value.*

***Novelty.*** *Scientific novelty of the results is that the sensitivity function of tone reproduction of a given range of tone reproduction has been set that characterizes the properties of the system to various influences, in particular, to the effects of raster dot gain in different ranges of tone reproduction.*

***The practical significance.*** *We have found out that sensitivity of short ink printing system of parallel structure of the fifth dimension is uneven and depends on the range and tone reproduction and lies between 0,2–0,7. The research results can be used to assess the impact of raster dot gain that must be considered when organizing tone reproduction, combining of the original density ranges with the density of a raster print.*