UDC 655.027

**MODELING OF AUTOTYPE TONE REPRODUCTION WITH A ROMBIC RASTER ELEMENT IN A SHORT INK-PRINTING SYSTEM   
OF A SEQUENTIAL STRUCTURE**

**M. M. Lutskiv, P. Z. Kurka**

*Ukrainian Academy of Printing,*

*19, Pid Holoskom St., Lviv, 79020, Ukraine*

*petiaman@gmail.com*

***Research Methodology.*** *The methodological basis of the study is the principle of balance of ink streams in the ink printing system. To solve this problem, the theory of signals has been used for the modulation of the ink flows by the raster printing plate, the theory of errors — to determine the deviation of the characteristics of the autotype tone reproduction from the linear one, graph theory — for describing the structure of the ink flows, simulation — for the calculation and construction of the set of characteristics of tone reproduction for different lineature.*

***Results.*** *In the study, a mathematical model has been developed that describes the autotype reproduction of raster images for elements of rhombic shape in a short ink printing system of the fifth dimension. A structured scheme of the simulation model has been worked out on the basis of which a simulator in the Matlab Simulink package has been developed, which simultaneously calculates and constructs the characteristics of tone and linearity deviations. The results of imitation modeling have been presented. It has been established that in the case of the steady ink supply to the input of the system, the deviation of the characteristic from the linearity is in the range from -8.5% to + 22.4%, which decreases the quality of the images. The work is of practical importance.*

***Novelty.*** *The scientific novelty of the obtained results is that the analytical dependence of the autotype tone reproduction for short ink printing systems has been set, which will serve for the correction of tone reproduction at the stage of preparation of images prior to screening.*

***Practical Significance.*** *It has been established that the deviation of autotype tone reproduction depends on the tone reproduction range, which can be used to select the capacity of the anilox roller for the given image.*