

V. N. Karazin Kharkiv National University
School of Mathematics and Computer Sciences

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“Differential Equations and Control
Theory”**

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Book of abstracts



**V. N. Karazin
Kharkiv National University**



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Mathematical simulation of cold extrusion processes with complex tool configuration

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Cold extrusion processes provide a high surface quality and precise dimensions of stamped workpieces and parts and demonstrate a steady trend to expansion of technological capabilities and implementation in manufacturing [1]. The configuration of the tool (the presence of roundings) allows to form the required profile of the part and significantly affects on the deformation and power modes of the deformation [2], [3]. Determination of the optimal power mode in the form of engineering formulas, taking into account the influence of design features of the tool, will contribute to a more active implementation of these processes in the manufacturing. Proposes the using of an approximate curve as a replacement for a quarter of a circle reflecting of the matrix rounding. Developed new kinematic module with rounding allows to expand the capabilities of upper bound method for modeling the processes of cold extrusion with a complex tool shape [3]. This will allow in the future to use the above calculations in new schemes and will help to obtain an assessment of the power mode and shape resizing and, as a result, to develop recommendations for the optimal configuration of the tool and more active implementation of these processes in the manufacturing.

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