

# Mathematical Modelling on the Basis of the Projective Geometry

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**Abstract.** The purpose of mathematical (geometrical) simulation consist in definition of optimum conditions of behavior of a studied process, its control on the basis of a mathematical model and transmission of outcomes on object. The descriptive geometry at the present stage has closely related to the research of multidimensional varieties of different structure which, as it appeared, lays in the deep fundamentals of numerous processes.

Any substantial process from the mathematical point of view represents a classical example of development of a multidimensional functional space in which continuous processes of quantitative change such components as fluidity, temperature, conductivity and other parameters of reactions. The descriptive geometry, being one of sections of mathematics which synthetic apparatus has an engineering directivity, forms a bases for development of geometrical simulation methods for objects of a different nature and structure and also for chemical, physical, economic and social processes.

The author develops methods of designing the multidimensional monoidal surfaces given by discrete assemblage of data points used for synthesis of new materials, the solution of the complex ecological problems, the simulation of chemical and technological productions and engineering systems. For simulation of chemical production processes with nonreactive and responding chemicals, two techniques for obtaining models and their optimization are developed. The first technique is applied to simulation of processes with nonreactive substances. Surfaces in this case generate only unidimensional generatrix. For its realization the theorem has been formulated and proved: The sum of three equations of a sheaf of right sections give an equation of a model.

Results of the author can be grouped into the three aspects:

- solutions of technical problems at a level of inventions and patents;
- capabilities of directed search of design solutions on optimal modes of technological manufactures;
- productive aspect for which it is possible to call heuristics based on abilities of mathematical modelling on the basis of design geometry to reveal functional relationships between multidimensional experimental values. Practice of application of the techniques to research of electrodeless electrochemical processes shows also the heuristic capabilities of the techniques permitting not only to find out best values of prototype processes but also to plan the experimental trials considerably reducing scope of work and time for obtaining the adequate outcomes.

For realization of the trials, program Giper has developed and patented.

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