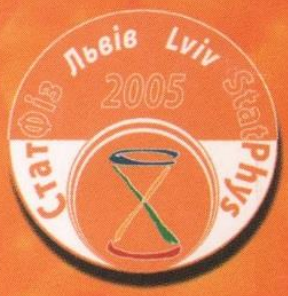
Statistical Physics 2005:

Modern Problems and New Applications



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Synergetic economics of the manufacturing firm with mass production output

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Statistical Physics essntially expands the field of it's application, it penetrates into such closely-related fields of knowledge as chemistry, biology, meteorology more and more. Statistical Physics is one of the main instruments which could be useful for description of system's self-organization in the comparatively new fied of knowledge, called "Synergetic Economics". The application of the methods of Statistical Physics for it's description is possible owing to the representation of the manufacturing firm with mass production output in the capacity of the system with numerous quantity of elements (the basic products) of stochastic nature, being in the production process. Conduct of the basic products lengthwise the technological chain depends on the definite manufacturing and technological laws in accordance with the technological process of the manufacturing firm, it's production plan, the availability of manpower and equipment. The state of the production sestem's basic products at any time moment is given as the point in the two-dimensional phase space. The function of the basic product's distribution in the rate of expense's variation is set and the equation having analogy with the kinetic equation in Physics is put down here. The engineering and production function, which is analogous to the force moving the basic product lengthwise the technological chain of the production process, is given and can be determined with the help of technical documentation of the article's manufacture approved in the manufacturing firm. The generating function describing the interaction of the basic products (the system's elements) during their moving lengthwise the technological chain of production process with technical equipment, is based on the equipment disposition schemes and it's technical characteristies according to the schedule of the workpieces machining. The closed system of balances equations for the moments of distribution function is put down here in the zero approximation with the small parameter, with the usage of the kinetic equation. The system of balances equations describes the conduct of the basic economical macroscopic rates of the production system, such as process stocks, pase and dispertion of the production output lengthwise the technological chain. With the help of the balances equations the well-known relations of the business operation theory used for the calculation of stocks and pase of the production output were obtained.

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