

# APPLICATION AREA OF THE DOUBOCHINSKI QUANTUM MACROPHYSICAL EFFECTS PHENOMENON

The practical application areas of the discovered “Doubochinski Quantum Macrophysical effects” phenomenon, based on excitation of argument periodic processes (oscillations and rotations), can be divided into:

- scientific, fundamental trends;
- application in the engineering and technologies industries;

## 1. APPLICATION IN THE AREA OF FUNDAMENTAL RESEARCH

This application area includes trends connected with the development of fundamental research, the implementation of which, from the point of view of the phenomenon of excitation of argument oscillations, opens new possibilities for solving big and complex problems of natural science.

### 1.1. Classical mechanics, theoretical physics, wave mechanics

- New knowledge and theoretical instrument for studying characteristics and mechanisms of interaction in the area of matter structure, system and processes of macro- and microworld. For example, in accordance with the results of theoretical and experimental research, proving that the argument oscillations phenomenon, as well as the characteristics of quantum and discreteness, are the fundamental characteristics of the matter, of the oscillation processes and of the systems, irrespective of whether they belong to macro- or microworld. As it follows from the research results provided earlier in the monograph, quantumness and discreteness are the result of argument interactions of periodic radiation (exposure, force, wave, field, etc.) with an oscillating (rotatory) system, and not the result of the specific characteristics of microworld systems' functioning.

- New physical and mathematical models for studying and solving such important problems as:

- a) controlled thermonuclear fusion;
- b) direct (without any regulation and synchronization electronic systems) energy conversion. For example, direct transformation of solar or thermal energy into electrical and/or mechanical energy (or vice versa) as it happens in nature when life forms and flora consume solar energy;
- c) efficient energy conversion by a frequency conversion that takes place when carrier frequency is divided and/or multiplied by a great number (tens, hundreds and thousands) of times in the systems, which realize argument oscillations and also in the systems of animate and inanimate nature. The presence of this characteristic of the mechanism of argument oscillations realization allows, for example, to explain how high-frequency energy of solar spectrum and thermal energy generated by it are directly transformed into internal energy of a wide range of nature systems surrounding us, the eigenvalues (resonant) frequencies of which are within the range from tenths to millions Hz;

- d) mechanisms and principles of functioning and organization of the solar system, other space ensembles and systems;
  - e) distribution laws of frequency spectra of atoms of various elements;
  - f) mechanisms of organization, self-organization, adaptation and regulation, realized by big and complex systems, such as, for example, environmental living biological systems.
- New theory as a basis for mathematical and physical calculus, allowing to research and calculate parameters of a new class of systems and processes, realized on the base of discovered excitation of argument oscillations phenomenon.

## **1.2. Applied sciences**

- Possibility of solving problems in the sphere of applied sciences, for which there are no solutions or the solutions haven't been found yet. For example, the creation of artificial cybernetic "intelligent" systems capable of self-regulating and self-adapting as the result of realization of the argument interactions mechanism (no need to be fitted with the complex electronic regulation, synchronization and control systems).
- Development and improvement of modern engineering and technologies.
- Creation of new engineering and technological trends on the basis of using the mechanisms of energy quantization and functioning modes of the systems with a discreet set of stable states.

## **2. APPLICATION IN THE ENGINEERING AND TECHNOLOGIES AREA**

The applications areas are classified according to the main characteristics and principles of realization of the argument interactions mechanism.

### **2.1. Discreteness**

The physical essence of this peculiarity of the argument interactions mechanism includes the following:

- a) the stable periodic movement mode realized by the system (oscillations, rotations and/or their combinations) belongs to a discrete range of its stationary functioning modes; moreover the realization of each of such modes, with all fixed values of system parameters and periodic exposure, is defined only by initial conditions;
- b) one and the same periodic action of the fixed frequency and amplitude can simultaneously support (as the result of argument interactions) eigenvalues stable periodic movements of a wide discrete range of oscillatory systems with various resonant (eigenvalues) frequencies which can be ten or hundred times higher or lower than the exposure frequency;
- c) possibility of excitation of eigenvalues (resonant) stationary oscillations of one and the same system by different periodic exposures, the frequencies of which belong to a discrete frequency range.

## Application areas

- **mechanics and electrical engineering:** electric and electromechanical drives, linear and rotary motors, generators and other devices capable of realizing functioning modes with a discrete multitude of conditions (speeds, frequencies and amplitudes);
- **radio engineering:** *basic computing devices for developing, for example, multi-level triggers with a discrete multitude of levels and able so to obtain a base element that will have any predefined number of information bit (8, 16, 32, 64, 128, etc) for:*
  - ◆ automation devices, switching systems, digital and logical circuits, memory systems, “quantum” computers;
  - ◆ control, synchronization and automatic regulation systems;
  - ◆ pulse measurement equipment, cybernetic self-regulating and self-adapting systems.

## 2.2. Frequency conversion

Efficient division or multiplication of one frequency range into another with a high conversion coefficient. Therewith, the frequency is converted immediately without using the procedure of consecutive division or multiplication of the carrier frequency, for example by two, and also without using any electronic equipment.

This characteristic can be used for creating powerful energy sources of low, ultralow and high frequencies.

The application of this characteristic proposes a solution for such technical problems as creating superpowerful energy sources for performing controlled nuclear fusion.

This characteristic can also be successfully applied in the spheres of mechanics, electronic equipment, radio equipment and wave mechanics, and also other spheres of science and engineering, for example, for creating new types of frequency converters for transport, frequency generators and battery chargers.

## 2.3. Automatic regulation

This characteristic consists in the fact that during the process of argument interactions the energy absorption by the system of the external periodic exposure is realized by the mechanism of automatic regulation (self-regulation) of this energy in accordance with the system needs for compensating its dissipations and loads. Moreover, this energy self-regulation mechanism has a high selectability and stability under conditions where the amplitude of periodic exposure is changing ten and hundred times, and also when the system is influenced by other various one-shot or continuous forces.

This mechanism of self-regulation can be used for creating automatic self-regulating and self-control systems, capable of supporting constant values of output parameters in devices with the use of energy sources unstable by amplitude, and also in the conditions of unstable environment parameters. One of the simplest and most effective application is a current or voltage stabilizer with variations of the base source amplitude from 100 to several thousand percent.

## **2.4. Energy conversion**

Practical application of this important characteristic of the argument interactions mechanism allows creating:

- ◆ a new class of energy converters, for example, converting electric energy into mechanical, wave or thermal energy and vice versa;
- ◆ measurement equipment with the qualities described earlier in sections 2.1-2.3 of this Summary;
- ◆ devices for wireless energy transportation to long distances;
- ◆ devices converting wave energy into natural (resonant) oscillation energy in systems of different physical nature; for example, converting solar or thermal energy directly into electrical or mechanical energy.

## **2.5. Increase of performance and efficiency of the existing technological processes and production intensification**

The possibility of solving the problems stated above is based on new principles, included in the physical essence of the mechanisms realizing argument periodic processes.

The increase of performance and efficiency of technological processes and their intensification can be carried out by the means of imposing additional periodic exposures over the existing process and organizing argument interactions; for example, as it is described in the methods stating how to prepare emulsions and divide physical environments (for more details see the corresponding section of the given 5<sup>th</sup> annex).

The main advantages of the suggested intensification method are:

- possibility of a significant decrease of energy and time efforts (by two-three times, sometimes by ten times) as compared with the existing efforts in the modern technology;
- possibility of achieving the efficiency stated above while totally preserving the existing production manufacturing technology.

The application of the new intensification principles opens new possibilities for increasing efficiency and accelerating technical progress in many production areas. This, in the first place, concerns the manufacturing industries of paint and lacquer, food and paper, pharmaceutical, perfume, as well as many other industries, which involve processing of materials, their refinement, mixture, emulsification, separation, material dispersion, pulverization and complex processing.

The methods and technology of the intensification process include the following three trends in their application:

- increase in productivity during mechanical processing of hard materials, drilling, grinding and their combinations;
- increase in productivity and efficiency during breaking-up of various materials;

● acceleration of galvanization and crystal growing processes, thermal and chemical processing and chemical reactions.

## **CONCLUSION**

In general, the discovered phenomenon of excitation of argument oscillations can find a wide application in different areas of science and engineering. Various device classes with characteristics unknown before, such as self-regulation of energy consumption, self-adaptation, availability of a discrete set of stationary functioning modes, stability and independence of measurement over a wide range of environment parameters changes, allow to foresee their application in electrical engineering, mechanics, radio engineering, biology, chemistry, thermal engineering and other areas of energy production and conversion.

# APPLICATION AREAS

