

NON-LINEAR DYNAMICS. PREREQUISITES FOR THE TECHNOLOGICAL BREAKTHROUGH

More-than-15-year investigations in the field of dynamics systems of discrete time, first oriented at the cryptographic applications and microelectronic technologies, have lead to the discovery of the pre-arithmetic, which precedes the classical arithmetic of the algebraic system of incomplete arithmetic and is its extreme case.

Not going into detail, in pre-arithmetic, the addition operation $\mathbf{a} + \mathbf{b} = \{\mathbf{c}, \mathbf{p}\}$ allows decomposition, into a time-expanded recursive sequence, of simplest, not derived from each other, simultaneously performed actions over a number pair $\{\mathbf{c}, \mathbf{p}\}$ – the result of operation \mathbf{c} and its complement \mathbf{p} formed by the carry flag. During the recursion, complement $\mathbf{p} = 0$ turns into zero characteristic for classical arithmetic – $\mathbf{a} + \mathbf{b} = \mathbf{c}$.

Due to the one-oneness (isomorphism) of the physical laws and mathematics, under conditions of the potentially finite velocity of propagation of interactions, **the addition operation cannot be realized instantly, is accompanied by transient (nonlinear) processes and an inductive components \mathbf{p}'** , introduced in pre-arithmetic by its complement \mathbf{p} . The neglect of these factors inevitably leads to the appearance of phenomenological phenomena and effects, which cannot be described unambiguously or interpreted reasonably from the point of view of modern science. Undoubtedly, this unusual hypothesis, fully obliged to the achievement in algebra and an extremely high constructive character of the stochastic technologies, also requires a reliable experimental confirmation.

Undoubtedly, we live in epoch-making time, at the turn of the centuries and millenniums, when under the action of the technological revolution being performed, **the knowledge becomes the main creative force of the development, economic and social prosperity of the society**. And together with them, the depths of Consciousness and phenomenological abilities of humans are being revealed more fully.

Vedic knowledge of the ancients and elite knowledge hidden in secrete laboratories become the part of the enlightened humanity claiming to be the engine for the technological development of the society, namely, **in many respects hypothetically and undisputably**:

- ◆ the scientific paradigm concerning the primacy of the matter and consciousness and their mutual relations undergoes qualitative changes, appearing in the attempts of synthesis of ancient knowledge about a human with the modern achievements of the science, eastern and western philosophy and religion;
- ◆ hermetic philosophy (Kybalion), Tantrism, rajah yoga and other inheritance of the past, attempts to create the physics of vacuum (G.I. Shipov) and the unified field theory (A. Einstein);
- ◆ achievements of the long-past mysterious civilizations (Atlantis and Maya), introduction of the idea of torsion fields (E. Cartan, 1913), and the development of technologies on their basis A.E. Akimov, 1980), as well as new phenomenological technologies close to them (N. Tesla);
- ◆ paranormal, bioenergetic, and extrasensory perception of a man, magic in its all phenomenological representations, including legends of ancestors and predictions of soothsayers, the noticeable surge of the number of people with extraordinary abilities observed in the last decades.
- ◆ western folk and Old eastern medicine, other nontraditional ideas about the human body functioning and renovation, which cannot be explained within the known scientific theories.

The presented far-from-complete list of phenomenological knowledge supported by the experimental data, technical solutions, and technological developments found in open sources makes it possible to cover extremely wide **classes of applied problems and most significant practical applications**:

MEDICINE. Homoeopathy, production of water, minerals, and other substances with the medicinal, stimulating, and health-improving properties. Development of traditional and nontraditional methods for bioenergetic, acoustic, color, electric and magnetic general-purpose and individual diagnostics and therapy aimed at correction and recovery of the functional activity of organs and systems of human.

LIFE-SUPPORT. Water desalination and purification, air purification. Recycling. Biophysical protection installation, prevention of deleterious effects of the fields, in particular, fields generated by technological devices, electric and radiofrequency devices, home appliances, microwave ovens, TV sets, and computer displays.

COMMUNICATION. Noise-immune and secure transmission of information at any distances without noticeable signal attenuation, even through radiowave-proof barriers.

POWER ENGINEERING. Production of ecologically pure energy due to the use of inexhaustible energy of physical vacuum, control of energy fluxes of different types and applications. Super-high profitable electrical and heat supply of living premises, industrial premises and utilities. In his highly

instructive and unambiguous speech, US President Barack Obama said "... the country, which in the 21st century will become the world leader in the production of pure energy, will be the leader in the global economy of the 21st century."

AGRICULTURE. Climate control. Soil treatment. Pest and epidemic control. Increase in the productivity (plant growing, animal breeding, etc.), increase in the quality, ecological purity and safety of agricultural products.

MATERIAL PRODUCTION. Control of the kinetics of chemical reactions, interatomic and molecular compounds. Increase in the rigidity and elasticity, change in the thermal and electrical conductivity, in the magnetic and other properties of inorganic and synthetic materials.

TRANSPORT. Production of engines employing inertia forces as well as the control of the force and direction of the gravitational thrust vectors making it possible to move objects and cargo of any weight in atmosphere and outside it at small power inputs and at high velocities.

GEOLOGICAL PROSPECTING. Search for fossil minerals from near-earth orbits and near space, which will provide an almost 100% reliability of the discovery of deposits.

According to data from open sources, a small part of the above-mentioned directions has been exploited or is being exploited, and a part is being taken hypothetically, ambiguously.

Despite the urgency and significance of the presented technologies, their development is substantially hindered by the imperfectness, exorbitant complexity, incompleteness or absence of the comprehensive scientific and technological bases. In this respect, by introducing the pre-arithmetics, **the approach based on the transition from dynamic continuous-time systems to discrete-time systems and vice versa** (a kind of mutual transition from analogue processing to digital, from sinusoidal harmonics to rectangular), in the light of recently obtained results, looks quite realistic and most preferable.

Following the logic of the facts introduced by pre-arithmetic, the addition operation and the arithmetic operations derivative with respect to it are realized not simultaneously but during the finite time in the development dynamics of real systems, are accompanied by the inductance component and transient processes. After the termination of these processes, as the investigations show, the system is phenomenologically self-synchronized, achieves its equilibrium and develops further according to known physical laws typical of the so-called regular systems.

In the general case, it is not completely obvious and necessary that the system and its components will develop in the above-mentioned manner. Another development means, in essence, another movement, another dynamics and arithmetic; in other words, non-regular, and along with it, nonlinear dynamics of behavior. It can be shown that this non-regular behavior of the system can be formally represented by a mathematical series using habitual arithmetic operations. But this description, as in the case of dynamic continuous-time systems, becomes cumbersome, difficult to interpret, and hardly applicable in practice.

To confirm this, investigations started at the end of 2007 and the latest results (June 2010) show the existence of a set of other pre-arithmetics. Not going into detail of the proposed working hypothesis, **the existence of different pre-arithmetics and other arithmetics indicate the new mathematics, physics of discrete and continuous time, and fields, the possibility to generate, accumulate, transform, and release the energy bound with them, to perform transitions from one state of the matter to another, to substance and vice versa**. New algebraic systems and technologies following from them can give a stimulus to the development of mathematics, physics, and natural sciences on the whole, and together with them, to cover to a full extent the above-mentioned phenomenological phenomena and processes, the achieved scientific and technological results.

To confirm the above-mentioned working hypothesis, using the existing groundworks, which significantly outran the world level and experience accumulated for many years, **works were started to develop the approaches of physical interpretation of pre-arithmetics**.

For this purpose, in 2010 an experimental electrodynamic model in moving media in the visible frequency range was created by using the means of computer graphics. Based on this model and pre-arithmetics, a complex of color-graphic induction generators partly designed for medical technologies and life-support technologies was developed. **The nonlinear effects observed in the experiments well agree with the main concepts prescribed by pre-arithmetic**. In addition, the appearing phenomenological and optical effects, especially strong on the resonance regimes of operation, point to the practical significance of the obtained results and the necessity of a research aimed at the development of effective and profitable technological solutions, which originate from the non-regular dynamics of the behavior of the systems, and their development testing.