

ABOUT POSSIBLE MECHANISMS OF THE SOCIAL MANAGEMENT.

Part I. AUTOCORRELATION FUNCTION CALCULATIONS FOR THE MECHANISMS

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ABSTRACT

Based on the early developed analytical approach for 3-rd order non-stationary stochastic processes (NSP-s) development a possibility of the generalized approach application to the managing process is analyzed. The approach was reformulated in general form to be universally applied to a quantum size particles, assumed simultaneously participate in the following type of motion: 1) chaotic oscillation in nano-scale, 2) translation themselves in macro-scale.

In the 1-st part of the article autocorrelation function (ACF) values were calculated for each of the two predicted by the approach regimes for NSP-s development. Only one possible variant for a delay time non-monotonous dependence of the ACF was shown to exist for the 1-st regime of the non-stationary stochastic processes development. The mechanisms of the revealed two regimes were analyzed and associated with the "military" (ordered) and "civilian" (diffusive, disordered) energy transferring. The three possible variants for the delay time dependencies were observed for the 2-nd regime. Two of the variants were analogous each other in conserving similar, relatively high ordering levels for the most time periods of their developments but having decreasing and increasing the dependence parts on the finishing stage of the regime development. The third variant has monotonously decreasing time dependence of the ACF.

In the 2-nd part of the article, conditions for development the revealed two regimes of a NSP development were analyzed in detail. Based on the widely used principle of "analogy" for NSP-s in the Universe it was shown that the revealed NSP regimes have to develop practically simultaneously to provide the polycrystals high plasticity. The analogous conclusion is supposed to be truth for a NSP management. The obtained conclusions were shown to be confirmed by the relevant data from the modern and historical management practice.

Keywords: 3-rd order non-stationary stochastic process, early developed analytic approach, autocorrelation function calculations, features of the mechanisms for the revealed two management process regimes.

1. INTRODUCTION

Based on the early developed approach for describing a 3-rd order NSP development [1-5], human creatures are considered as subsystems transferring a form of the energy originally generated by the Big Bang. Then, a social management may be considered as a system of actions aimed to force peoples on Earth to do all necessary do not contradict the Universe evolution. More specifically a social management may be defined as a system of actions concerned with governing people to transfer them in a new state, which provides their more effective functioning. Taking into account the existence of the starting and finishing points or corresponding time moments for the process, it may be considered as a **non-stationary stochastic process (NSP)**. Besides a management process may be considered as including 3-stages or time periods:

- 1) a time period for explanation and verification of the management principles to the people and their understanding by some of people without the most people active participation in supporting the process;
 - 2) increasing support of the governing efforts and active participation of an increasing part of a people society in the management process;
 - 3) full support, understanding and the whole people society participation in the management process.
- Taking the last NSP features into account, we may apply the early developed approach to analyze a social management process.

Types or mechanisms of the management are an object of continuous interest and efforts of theoreticians and practical's [2,4]. Probably, the biggest attention to the problems of improving social management effectiveness is paid at last few decades [1,3,5]. The main reason of the situation probably is the proven notion about crucial role of the management [1,3] in providing high effectiveness of industrial processes. Meantime, improving the management mechanisms has old history. Probably, as the oldest attempt to solve the problem one may consider change of the Old Commandment to the New Testament about 2500 years ago. It is known that the Old Commandment describes situations when God supervised humans directly, through His Prophets. In such cases Prophets transfer the God's commandments to the people and require their restrict obeying. In the cases of ignoring the requirements the people had punishments. The most known example of the situation is, probably, Sodom and Hommora case. The people lived under such management mechanism for some centuries until the low effectiveness of the mechanism became evident. Then God forced to make global flood. Later on, finally the next step was made – to manage people by informing everyone individually about the God's plans, that was made by showing the people the most trustable event: innocent death of the God's Son- Jesus Christos. Probably the first man who realized the God and His people conversation problem was Thoma Aquinsky in 12 or 13 century, who

declared a way to solving it: to combine overall trusting in God with individual everyday practical working every human for improvement his own potentials. As an example of the above, the well known story about hidden talents may be considered.

To proof the idea in our time it is enough to compare achievements the Western democracy countries with the Eastern ones in science, culture, music etc. The last type of countries have important achievements in technique and technologies but not – in the above branches of human activities.

The modern history of the humankind also provide many examples of low final effectiveness of dictatorship and benefits of democratic societies, despite many lacks of the latter. The relevant examples of the notions are also existed in science and technologies: “military” and “civilian” phase transformations [6], totalitarian and democratic countries etc. As the modern example of the relevant theoretical results, an analytic approach conclusions [7-9] should be considered. The approach was early developed and first applied for quantitative successful description of the 3-d order NSP-s, one of which is the macroplastic deformation of polycrystalline metals. Later on some aspects of our visible Universe evolution were also considered and explained [10].

1. BRIEF DESCRIPTION OF THE BASICS FOR DEVELOPED ANALYTIC APPROACH

Due to the detailed and specific description of the early developed analytic approach in [7-10], let us briefly recalling its basics in the maximally general way. At first, we are considering a macroscopic system as consisting of uncountable number of quantum-size subsystems being at a time under an action of the external energy E gradient dE/dx at a constant absolute temperature T . The following additional general assumptions have also to be made. Namely,

- any subsystem has quantum size dimensions and chaotically oscillates in various directions in space so that its fixable (macroscopically measurable) distance and velocity of the macroscopic motion are averaged results of its individual oscillations or steps;
- the oscillations provide nano-scopic motion of a subsystem, the corresponding macroscopic velocity of which may be zero or not zero depending on amount of steps in alternative spatial directions;
- determined changes in average (macroscopic) subsystem motion directions and the velocity are caused by an action of external energy gradient or forces according to known dynamics.
- acting an external force on a whole system provides the equivalent external stress or force action on any subsystem comprised by the system.

All above assumptions are in accordance with the fundamental contemporary physical theories (physical vacuum fluctuations, strings and superstrings, dislocation theory, Brownian molecular motion etc.) and are confirmed experimentally by the numerous observations [7,10].

Some features of the approach and subsystems behavior in general case should be emphasized here.

Namely, oscillations of the subsystems provide a special type of the motion, which we shall call “nano-scopic” one e.g. it is cannot be detected by macroscopic measurements and are caused by the physical vacuum fluctuations [10]. This motion type includes a subsystem elementary steps in various spatial directions which may develop with equal and not equal probabilities of the alternative ones. Evidently, that the nano-scopic motion can provide the macroscopic or measurable motion with not zero average or macroscopic velocity, which can be zero one, depending to relation of the corresponding probabilities. It is supposed also, that velocity of the nano-motion is equivalent to the speed of light, c . Besides, we suppose that the Heizenberg uncertainty relations are valid [11] for such objects, namely:

$$\begin{aligned}\Delta E \cdot \Delta t &\geq h \\ \Delta p \cdot \Delta x &\geq h\end{aligned}$$

In a particular case of possible rigorous mathematic equalities which conserve the physical sense of the uncertainty principle, dividing the above relations by each other gives:

$$(\Delta E \cdot \Delta t) / (m \cdot \Delta v \cdot \Delta x) = 1$$

Based on the above assumptions for the speed of the nano-motion for a tiny particle, we shall write $\Delta v \equiv c - 0$:

$$\Delta E = m \cdot c \cdot \Delta x / \Delta t \quad (1)$$

Further, we shall define:

$$\begin{aligned}\Delta x &= x / \Delta n_{mcr} \\ \Delta t &= t / n \\ n &= \Delta n_{mcr} + \delta n_{nano}\end{aligned}$$

Where: x –is a macroscopically measurable distance having gone by a subsystem by the time t ;
 t –is the macroscopic time that spends by the subsystem to move on the distance x ;
 n - is the whole number of elementary steps done by a subsystem for the whole time period t .

Δn_{mcr} — is a difference of elementary steps numbers having done by a subsystem in alternative directions resulting in the subsystem macroscopic motion;

δn_{nano} —is a number of a subsystem steps corresponding only to its nano scopic motion or – macroscopic unmoving condition;

Δt —is a value of the elementary time interval for a subsystem to do one step, or to move on a distance Δx ;

It should be emphasized that Δn_{mcr} may be equal to zero, that corresponds to macroscopically unmoving condition for a subsystem despite the continuation of its nano-scopie motion. Meantime n can not ever be equal to zero, because it corresponds to whole steps-number during life-time for a subsystem in the Universe or includes all steps, corresponding both to macroscopic moving (Δn_m) and the unmoving (δn_{nano}) subsystem conditions, the last of which corresponds only to nanoscopic subsystem motion:

$$n = \Delta n_{mcr} + \delta n_{nano}$$

Going back to equation (1), we may write now:

$$\Delta E = mc^2 (n / \Delta n_{mcr})$$

$$\Delta E = mc^2 [1 + (\delta n_{nano} / \Delta n_{mcr})] \quad (2)$$

As it flows from eq. (2), increasing δn_{nano} together with decreasing or constant $\Delta n_{mcr} \neq 0$ under the initial condition $\delta n_{nano} / \Delta n_{mcr} < 1$, leads to increasing an energy consumption ΔE providing further subsystem macroscopic motion. The above result may be interpreted as follows: slowing down the macroscopic motion of a subsystem requires increasing energy consumption to provide continuation of the subsystem macroscopic motion. Evidently, the situation corresponds the slowing down of the macroscopic subsystem motion by an obstacle. In other words - the stronger an obstacle is, the higher energy consumption is required for continuation of the motion. Contrary to the initial relation $\delta n_{nano} / \Delta n_{mcr} < 1$ e.g. the relation $\delta n_{nano} / \Delta n_{mcr} > 1$ for material objects in our Universe is practically unreal, due to the known continuous macroscopic motion of all material objects after the Big Bang contrary to its macroscopically unmoving: $\delta n_{nano} / \Delta n_{mcr} < 1$, condition. The above conclusions are in accordance with the results of the approach application to the macroplastic deformation of polycrystalline FCC metals as well as the Universe evolution observations [8-10].

To go further, the probabilities should be specified to describe a subsystem and the whole system behavior. Taking into account the just given definitions and the results given in [7-9], the corresponding probabilities were defined as: $p_I(dE/dx, t)$, $p_{II}(dE/dx, t)$ and $P_I(dE/dx, t)$, $P_{II}(dE/dx, t)$. Here $p_I(dE/dx, t)$ is the probability for a subsystem to occupy low energy state or to be only in nano-scopie motion without macroscopic one and $p_{II}(dE/dx, t)$ – is the probability to occupy high energy level by a subsystem or to be in a combined nano-scopie and macroscopic motion. As to the rest probability characteristics, they relate to the whole system with respective peculiarities of the possible system states. To specify the corresponding formula, we take into account that a subsystem being at a constant temperature T and has to be considered as able to exchange energy with a reservoir having the same temperature. Evidently that all physical objects, surrounding a subsystem and being in thermal contact with it, may be considered as a reservoir. Then, the probability for the subsystem to occupy an energy state has to be proportional to multiplication of the corresponding number of states for a subsystem and a reservoir [7,12]. Namely, for the highest energy state of a subsystem, we may write:

$$p_{II}(E_2, t) \sim q(E_2, t) \cdot Q[(E - E_2), t], \quad (3)$$

where: $q(E_2, t)$ - is an available number of microstates for a macroscopically moving subsystem;

$Q[(E - E_2), t]$ – is available microstates number for a reservoir.

Besides, an energy of a subsystem which is under an action of external energy gradient dE/dx or external force $f = dE/dx$ and macroscopically moves in a spatial direction x has to be dependent on two factors: $E_2 = E_2(f, x_0)$ here x_0 - is a coordinate of a point for a subsystem location. Here we suppose that $x_0 = x_0(t)$ due to the physical vacuum oscillations, which, evidently effect on a subsystem in any energy state as a quantum (tiny) physical object. As it follows from (3), the crucial step to specify $p_{II}(E_2, t)$ is the definition of $q(E_2, t)$ due to $Q[(E - E_2), t] = const$ for a macroscopic reservoir. Besides, for a quantum size (tiny) subsystem one should write [7,12]:

$$\ln [q(E_2 + \delta A; f + df)] - \ln [q(E_2; f)] = - [\partial \alpha / \partial E_2] \cdot df \quad (3)$$

where:

$\alpha = \delta A / df$.

$\delta A = dE_2$ is a macroscopic work done under a subsystem, occupying any energy state, including the highest one with the energy E_2

Besides, for an energy of a subsystem, we may also write:

$$dE_2(f,x) = [\partial E_2/\partial f] \cdot df + [\partial E_2/\partial x] \cdot dx \quad (4)$$

Based on the above assumptions, it may be stated that for any ordinary subsystem (particularly, unmoving or moving dislocation segment as a typical representative of the one), an increasing the external force ($df > 0$) rising its energy e.g. $\partial E_2/\partial f > 0$.

For a subsystem in general case, the possible reasons of the effect may be caused by changes of internal energy of a subsystem, because of, probably, changes of its spatial configuration (as a string in analogy with mobile dislocation segment). In a particular case of a mobile dislocation segment, the above its energy changes are caused by the change of a length of a moving segment.

On the other hand, for a subsystem, macroscopically moving along x direction e.g. $dx > 0$, two variants of a subsystem energy changes with a distance are possible: $\partial E_2/\partial x > 0$, $\partial E_2/\partial x < 0$. Namely, a subsystem macroscopically moving ($dx > 0$) under an action of an external force has to overcome existing obstacles that require its energy increasing (See eq.1) or restoration of the subsystem energy ($dE_2 > 0$). Taking into account the close analogy of the quantum-size particles (strings) with other material objects (dislocations), as a relevant to the considered situation example, the mobile dislocation jerky glide may be considered which is accompanied by increasing concentration of jogs on the dislocation segment. So, in such situation, one may write $\partial E_2/\partial x > 0$.

On the other hand, for the case of a macroscopically moving subsystem, just after an obstacle overcoming, one should write: $\partial E_2/\partial x < 0$, because a subsystem motion continues ($dx > 0$) to occur under decreasing energy ($dE_2 < 0$) accumulated before and used for the obstacles overcoming.

So, for the considered case one should write: $\partial E_2/\partial x < 0$. As a relevant example, the motion of a mobile dislocation segment, just after an obstacle overcoming in a crystalline lattice may be considered.

Besides, taking the above into account, we shall obtain from the equation (3):

$$d\{\ln[q_{1,2}(E_2, f)]\} = -(\partial \alpha / \partial E_2) \cdot d\tau$$

where $\tau = f/S = (dE_2/dx)/S$ - is an external stress acting on a subsystem;

$S = \text{const}$ - is a square of a system which is under the action of external force $f = dE/dx$;

$\alpha = d\varepsilon/d\tau$;

$d\varepsilon = \delta A$ - is infinitively small amount of work, done by external force f under a subsystem.

Conducting the elementary algebraic transformations, we obtain for the case of a subsystem, been at the highest energy state and be compressed to a nearest obstacle to overcome it, but having not overcome it yet:

$$d\{\ln[q_1(\varepsilon, f)]\} = -d\tau/f$$

Taking in to account that:

$$\tau = f/S$$

We shall have:

$$d\{\ln[q_1(\varepsilon, f)]\} = -(df/f)(1/S)$$

or:

$$q_1(\varepsilon, f) \approx q_0 \cdot (f_0/f) \quad (5)$$

where q_0 and f_0 - are integration constants.

So, the last relation defines the number of energy microstates available for a subsystem when it does not transfer energy within a system been under an action of external force f determined by an energy gradient (applied to the system). Besides, for the alternative situation or for a subsystem macroscopically moving after an obstacle having been overcome until a next obstacle is reached, but has not been overcome, we should write:

$$d\{\ln[q_2(\varepsilon, f)]\} = d\tau/f$$

$$\tau = f/S$$

Then, we shall have:

$$d\{\ln[q_2(\varepsilon, f)]\} = (df/f)(1/S)$$

or:

$$q_2(\varepsilon, f) \approx q_0 \cdot (f/f_0) \quad (6)$$

Thus, the last relation shows that the number of energy microstates available for a subsystem when it transfers energy within a system been under an action of external force f , which is determined by an energy gradient applied to the system and is directly proportional to the applied force f .

The both just considered dependencies are in accordance with well known experimental data concerned with the Bordony peak [15]. According to [15], a mobile dislocation segment initially fixed at pinning points, decreases its available microstates been pushed to an obstacle by an external force. Meantime, just after overcoming the obstacle, a number of the segment microstates is increased rapidly under the same loading conditions due to the jogs formation. Due to declared above principle of an analogy all NSP-s in our Universe, we may consider the all above conclusions as been truth for any NSP.

As it seen from the relations (5) and (6), the corresponding time dependencies have some unrealistic features, namely: $q_1(E_2, f) \rightarrow 0$ at $f \rightarrow \infty$ and $q_2(E_2, f) \rightarrow 0$ at $f \rightarrow 0$. Therefore, in general case, we shall use further the scheme shown on Fig.1. Recalling also that $E_2 \equiv F(dE/dx, x)$ and $x \equiv x(t)$ we shall write further: $q_2(E_2, f) \equiv q_2(f, t)$. Hence, under the loading conditions $f \geq f_0$, for the quantity $q_2(f, t)$ we may write:

$$q_2(f, t) = q_2(f_0, t) + \{\partial[q_2(f_0, t)]/\partial f\} \cdot (f - f_0) + \{\partial^2[q_2(f_0, t)]/\partial f^2\} \cdot (f - f_0)^2 + \dots$$

$$q_2(f, t) \approx q_2(f_0, t) + q[(f - f_0), t]$$

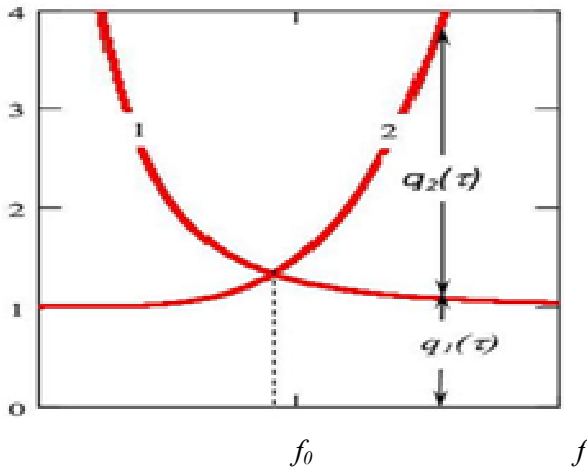


Fig.1. Schematic representation of the external force dependences for numbers of energy states for a subsystem been in macroscopically unmoving $q_1(f)$ (curve 1) and moving $q_2(f)$ (curve 2) states conditions

Additionally, from the above relations and the scheme shown on Fig.1, under the considered loading condition $f \geq f_0$, it may be written:

$$q_2(f_0, t) \approx q_1(f_0, t) \approx q_1[f, t]$$

So, the above relation may be rewritten as:

$$q_2(f, t) \approx q_1(f, t) + q[(f - f_0), t] \quad (7)$$

As it seen, the components of the last relation define numbers of microstates available to a subsystem been under an action of an energy gradient $f = dF/dx$, (force) respectively, in: 1) a state with low energy or unmoved macroscopically due to been pushed to an obstacle without its overcoming, but continue to move nanoscopically or oscilate chaotically, $q_1(f, t)$; 2) a state with highest energy when a subsystem just has overcome the obstacle and continue to move both macro- and nanoscopically for a long distance, $q[(f - f_0), t]$ to the next obstacle. Proceeding from (7), scheme shown on Fig.1 and the probability definition, we should write:

$$p_1(f, t) = q_1(f, t) / q_2(f, t)$$

$$p_{II}(f, t) = q[(f - f_0), t] / q_2(f, t)$$

Using also the above scheme and the probability normalizing condition, we obtain:

$$p_1(f, t) = q_2(f_0, t) / q_2(f, t); \quad p_{II}(f, t) = 1 - q_2(f_0, t) / q_2(f, t),$$

Besides, it is well known that for any system with unlimited energy spectrum, a number of available states is a rapidly increasing function of the system energy [12]. So, in our case of the subsystem, it may be written: $q_2(f, t) \sim f^n$ and $q_2(f_0, t) \sim f_0^n$, where $n = n(t)$ is non-negative parameter related to a subsystem degrees of freedom. So, we may rewrite the last expressions as:

$$p_1 \approx (f_0/f)^n; \quad p_2 \approx 1 - (f_0/f)^n \quad (8)$$

It should be emphasized, that expressions (7,8) defines the probabilities of the long distance, macroscopic motion of an individual subsystem able to carry energy under an absence of other ones. In more realistic situation,

we should consider a system consisting of numerous subsystems which are not interacting each other due to large between distance, been under an action of the same energy gradient and able to transfer an energy within the system. Evidently that, non interacting subsystems may be observed under the condition of gravitation forces and great distances between them that is observed in our Universe.

So, overall quantity N of the subsystems in a whole macroscopic size system having volume $V \rightarrow \infty$ may be defined as: $N = \rho_v \cdot V$, where ρ_v - is volume density of the subsystems. Considering the subsystems as indistinguishable ones and their independent behavior due to practical absence of interaction between them, it may be written for a probability to find an arbitrary chosen subsystem in the state of long distance macroscopic motion: $[1 - s \cdot (1/\rho_v \cdot V)]$, where $s \equiv (f_0/f)^n$. Further, the probability of the joint macroscopic motion of all the subsystems within a system or the probability for a macroscopic system to be in the state of internal energy transferring, will be:

$$\lim_{N \rightarrow \infty} (1 - s/N)^N = \lim_{\rho_v \cdot V \rightarrow \infty} (1 - s/\rho_v \cdot V)^{\rho_v \cdot V} = e^{-s} = \exp(-f_0/f)^n$$

Finally, the probability to find a whole system in the state when its internal energy is not transferred by the long distance, macroscopic motion of consisting subsystems is:

$$P_I(s) = 1 - \exp(-(f_0/f)^n)$$

and the probability for the same system to translate its internal energy by the long distance motion of consisting it subsystems is:

$$P_{II}(s) = \exp(-(f_0/f)^n)$$

It is necessary to emphasize an important role of the parameter $s \equiv (f_0/f)^n$ in description the behavior of:

- a quantum size subsystem able to transfer an energy due to its macroscopic motion under an action of an energy gradient;
- each of such subsystems having been a component of a macroscopic system consisting of numerous practically non-interacting subsystems which provide the system internal energy transport by their macroscopic motion;
- the whole macroscopic system which internal energy may be transferred by the long distance, macroscopic motion of consisting it quantum size subsystems.

2. AUTOCORRELATIONS FOR THE VARIOUS NSP REGIMES

According to the known definition [13] **auto-correlation function (ACF)** characterizes an effect of previous values of a NSP on its future values. In other words, ACF reflects similarity or predictability of a NSP parameter during NSP development. For the most general argotic NSP-s, ACF or $C_j(\tau)$ we calculated for each of the regimes ($j=1,2$) using the formula [13]:

$$C_j(\tau) = \frac{1}{T} \int_0^T s_j(t) s_j(t + \tau) dt$$

where: τ - delay time of an observation under a NSP,

T - time interval of the observations.

Computer calculation results are shown on Fig-s. 2 and 3. Fig. 2 demonstrates, particularly, that delay-time dependences $C_1(\tau)$ for the 1-st revealed NSP regime is, in general, non-monotonic. Namely, at small the delay-time values or at the beginning of the NSP development, $C_1(\tau)$ increases, that should be interpreted as an ordering in energy carriers behavior. But, going further, e.g. at longe delay-times, $C_1(\tau)$ decreases, approaching very low, but practically constant level. Such calculation results, evidently, show, at first, very low overall ordering levels (or $C_1(\tau)$ -values) during all the time of the Universe existence. Besides, relative increasing the ordered behavior level may be observed only on the beginning stages of such NSP (the 1-st) regime. Further, ordered behavior level rapidly decreases that means the disordering (chaoticity increasing) in the behavior of the subsystems on later stages of the 1-st revealed NSP development regime. These conclusions are confirmed by the numerous experimental observations of the dislocation substructure formation and its evolution in deformed polycrystalline metals [14], as well as, data concerned with dictatorship societies development.

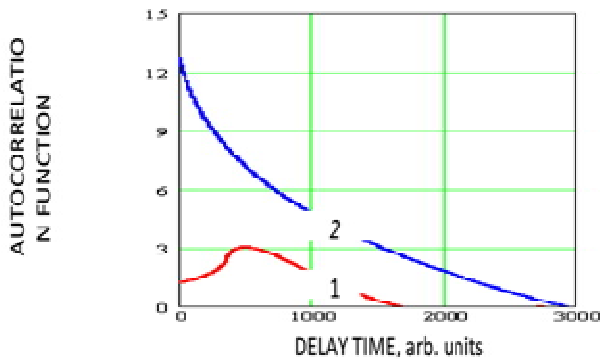


Fig.2. Delay time dependencies of the ACF for the 1-st (curve 1) and 2-nd (curve 2) regimes of a NSP

at $A_1 = 2.02$, $\hat{t}_1 = 1300$ s ; $A_2 = 10^{4.2}$, $\hat{t}_2 = 30$ s

As regards to the 2-nd regime of a NSP development, it was also shown [7,10] three possible variants of the delay time dependence $C_2(\tau)$ at various the approach constant values: - monotonously decreasing dependence (see Fig.2 curve 2) and two nonmonotonic ones (Fig.3 curve 1,2) [10]. The interpretation of the dependencies is proposed as follows: under some of the whole system structure types the behavior of the energy carriers is rather ordered with continuation the increase of the order level with time. Meantime there may be the whole system structure types for which the energy carriers behavior is ordered during the most time of the system evolution, but decreases practically to zero closer to finishing the evolution. The regulations described, may be frequently observed for many democratic human societies evolution.

3. TWO POSSIBLE MECHANISMS OF THE SOCIAL MANAGEMENT

Taking into account numerous observations of the basic features of a 3-rd order NSP during a process of managing people or social management, it may be stated, that:

- Human individuals, forming a group of people which is managed, have to play a role of subsystems transferring one form of the energy, which all was originally generated by the Big Bang in the Universe, including providing conservation (the industry sustainable development) and homogenizing (human multiplication) the transferring
- A social management process can develop by two possible mechanisms, one of which develops as a “military” energy transferring and the other – as a “civilian” one.
- Behavior of the individuals participating in the “military” management is rather ordered and demonstrates some predictability, especially on the starting stages of the governing process (see Fig.2). Further, the “military” management leads to decreasing the predictability or increasing the disordering in a social group members behavior.
- Behavior of humans participating in the “civilian” management in general is more ordered compared with the military one (Fig.2). and may have three various types of the delay-time dependences at various the model constant values (see Fig.3).
- One (see Fig.2) of the three possible variants of the “civilian” governing for a group of people, are characterized by the decreasing with delay-time the levels of the subsystems initially high ordered behavior (see Fig.2).
- For the second variant of the whole three ones (see Fig.3 curve1), a practically constant ordering level is conserved for the most time period of the managing process, with the level decreasing at the finish of the NSP.
- The third variant of the same “civilian” governing, (see Fig.3, curve 2); is characterized by the initial practically constant the ordering level, which increases on the finishing stages of the NSP development
- Taking into account the well known features of the totalitarian and democracy societies, the revealed mechanisms of the social management should be associated, respectively, with the dictatorship and democratic methods of the governing people

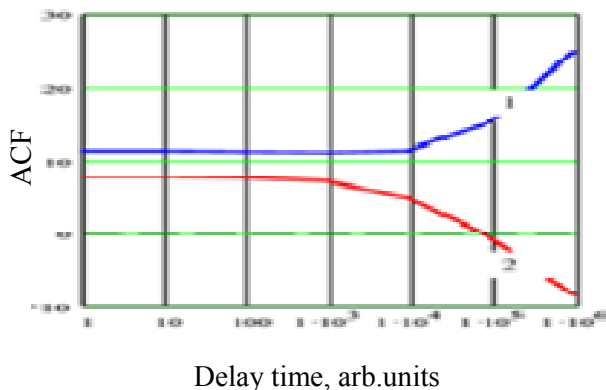


Fig.3. Delay time dependencies of the ACF for the 2-nd regime of a NSP at the approach constants values: $A_2 = 10^5$, $t_2^0 = 30$ arb.units (curve 1) and $A_2 = 10^7$, $t_2^0 = 30$ arb.units (curve 2)

- Regarding the second variant of the 2-nd (democratic) regime (see Fig.3, curve 1) of the social management development, the final decreasing the ordering level in people behavior up to zero should be considered as the democratic society degradation, that is possible development variant for young democracies.

- There are some historic examples of the just mentioned way of the young democratic countries development, namely Ukraine in 1917-1919 years, Chile in 1970-s years

4. CONCLUSIONS

1. Based on the early developed approach for describing a 3-rd order NSP development, human creatures are proposed to be considered as a kind of subsystems transferring a form of the energy originally generated by the Big Bang in our Universe.

2. A social management is proposed to be considered as a system of actions aimed to force peoples on Earth to do all necessary do not contradict the Universe evolution.
3. A social management is considered as consisting of 3 time stages: 1) a time period for explanation of the management ideas to the people that have to be managed, understanding the ideas by the people without the most people active participation in and supporting the process; 2) high support of the governing efforts and active participation of the increasing number of people in the management process; 3) full support, understanding and all people participation in the management process,
4. Based on the notions, the early developed and above discussed the approach was applied to analyze a social management process.
5. The basics of the applied approach are generalized for the case of tiny, quantum – size components of any physical objects in the Universe.
6. Calculations of the auto-correlation function values for both the above revealed regimes of a NSP development show the preferably ordered (military) and disordered (diffusive) mechanisms of the 1-st and 2-nd regimes development, respectively.
7. Possible types of the military and civilian social management are in accordance with the Old Commandment and New Testament variants of the God's governing people.
8. Predicted degradation of democratic countries due to disordered behavior of people is proposed to be considered as possible future variant for young democracies.

5. REFERENCES

1. *Out of Crisis*, L. Deming, MIT press (1996)
2. P. Howerstadt. *Fractal organization: Creating sustainable organizations with the Viable System Model* (2008) J. Wiley&Sons Ltd.
3. *Patterns of Strategy*, P. Howerstadt, L. Loh (2017) Taylor & Francis
4. Patti, Rino J. (2013) *Management: Overview*. Encilopedia of Social Work. doi:10.1093
5. D. Wheeler. *Understanding Variations: The Key to Managing Chaos* (2000), Spc.Pr.
6. J.W. Christian, *The Theory of Transformations in Metals and Alloys*, Pergamon, London (2002)
7. I. Tkachenko, V. Miroshnichenko, B. Drenchev, B. Yanachkov, M.Kolev A general analytic approach to analysis of nonstationary stochastic processes in thermodynamic systems. Part I: Formulation of the approach, *Engineering Sciences* (2022), v.3, p.48-64.
8. I. Tkachenko, K. Tkachenko, Y. Miroshnichenko, B. Drenchev, B. Yanachkov A general analytic approach to analysis of nonstationary stochastic processes in thermodynamic systems. Part II: Basic features of the constitutive equation analytic solutions., *Engineering Sciences* (2022),), v.4, p.41-56.
9. I. Tkachenko, K. Tkachenko, V. Miroshnichenko, B. Drenchev, Y. Miroshnichenko, B. Yanachkov A general analytic approach to analysis of nonstationary stochastic processes in thermodynamic systems. Part III: Practical application of the approach, *Engineering Sciences* (2023), v.1, p.38-50.
10. Fundamental aspects of theoretical analysis and technological application for nonstationary stochastic processes in nature and industry. I. Fundamental aspects. Tkachenko I., Tkachenko F., Nuradinov A., Tkachenko K., Miroshnichenko V., Tkachenko O., Miroshnichenko J., Kyiv, "ProFormat", 2024
11. Uncertainty principle- Wikiwand.com
12. F. Reif, *Fundamentals of Statistical and Thermal Physics*, Levant Books, (2010)
13. G. Korn, T. Korn, *Mathematical Handbook* New York: McgrawHill Book Company (1968) 804.
14. R.W.Honeycombe, *The Plastic Deformation of Metals*, Edvard Arnold, London (1984)
15. J. Hirth and J. Lote, *Theory of Dislocations*, Krieger Pub. Co., (1992)