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Water Vortex – Towards Sustainable Technologies

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ABSTRACT

In this article we discuss some new insights into dynamics of water molecule(s), and argue that, when treated properly within the fractal mathematics and implosion engineering, the wise use of water may well be an optimal solution for more environmentally-friendly future of our civilization. By combining contemporary fractal mathematics, natural water flow and the request for change of present industrial ''forever-growth'' models we propose some novel solutions for the development of more sustainable advanced technologies.
KEY WORDS: fractado, fractal mathematics, implosion, natural water flow, novel technologies

INTRODUCTION

Water covers much of the earth, fills our cells, pervades the skies [1]. It is present everywhere around us (seas, rivers, rain, lakes, air), and inside us: in a newborn infant, this may be as high as 85 percent of the body weight, but it progressively decreases from birth to an old age, most of the decrease occurring during the first 10 years of human life. Water is transparent to visible light, has neither smell nor taste, and is important for many mechanisms in cells, tissues and organisms. Already in 634-546 BC, Thales of Miletus emphasized the importance of water. In the course of the history, water has become one of the most important objects of study and some 67 water anomalies were detected during that time [1, 2].

The purpose of this article is to emphasize the natural water motion and it's huge potential in important applications in implosion technologies that are relevant to all facets of better human life.

Natural water flow

How does the water flow? The reply to this question can easily be found by looking at the bathwater flowing down the plughole: the water follows a spiral path. This spiral motion represents a natural water flow called - water vortex. Obviously water in nature does not flow straight ahead following the shortest path, but always follows the path of least resistance, within the subtle balance of all the fields that are present.

The liquid vortex forms as a result of acting gravitational and Coriolis fields enabling water to reduce flow resistance by curving inwards [3]. Moving in such a manner, water does not require much energy to move; moreover, under some circumstances the energy can even be produced.

Such movements and many other effects were already observed in 1930s, and core ideas can roughly be summarized as follows [4]:

- Prevailing 'explosion' technologies use unnatural forms of motion.
- Most machines and processes channel air, water and other liquids and gases into the type of motion which nature uses only to decompose and dissolve matter.
- When present technologies use the decomposing motion, these 'dead' technologies are destructive and affect the subtly correlated dynamics in all of nature.
- Nature uses another form of motion for rebuilding its harmonious 'infrastructure'.

Some 80 years later some of these notions are scientifically and technologically updated [1-3]. Despite of remarkable technological innovations and successes, the overall progress in 'natural engineering' is still slow. The evident ecological crisis is a proof that current ''explosive'' approach is unnatural. Here, we propose some solutions for more natural, sustainable technologies.

On Vortex Mathematics

The vortices have been extensively studied already by Descartes in mechanics [5], and later by Lord Kelvin, who proposed the vortex theory of molecules. J.C. Maxwell in his theory of electromagnetism [6] considered the vortex theory as a wonderful example of the interaction between mathematics and physics; subsequent notable extensions include quantum electrodynamics and superfluidity [7].

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Mathematical interpretation of the vortex systems represents one of the most important challenging topics in the timely development of the implosion engineering field [3].

Lawrence Edward described a number of different vortex forms with path curves, where the structure of invariant tetrahedron was the base [8]. Path curve is the locus of the point which is repeatedly moved by the projective transformation. He explained the vortex as a field between two planes and spanning from the point Y to the plane through point X and beyond i.e. above and below X and Y on the outside [9]. By describing the water vortex, the point Y was taken to be at infinity downwards, what is probably at the center of the Earth (6000 kilometers far away), which appears a long way away when compared to the size of the (water) form flowing down the plughole [9]. Lou de Boer outlined some path curves where the vortex spiral was described as a three-dimensional object with two real and two imaginary roots of characteristic polynomial [10]. Moreover, in such an approach two tetrahedron invariant points are real and two other are imaginary [11].

One recent proposal on the description of the water vortex system is given by Jurendic and Pavuna [3]: two approaches are proposed, *top-down* and *bottom-up* approach. In top-down approaches the concepts of open and closed water vortex systems were introduced, in which the open system represents system of water flowing in and out of the system. Moreover, closed water vortex system is understood as closed hydro-dynamical system that can mathematically be treated as a finite collection of molecules with a finite mass [3]. Fractal geometry approach, introduced originally by Benoit Mandelbrot [12], is especially highlighted, as it deals with natural phenomena with non-smooth surfaces and fractal objects (in this case water molecule or cluster).

Because of their obvious irregularities, water structures (water molecules and clusters) as natural objects are far more complicated to be treated as one-, two- or three- dimensional or by using a simple Euclidean geometry [3]. This is therefore a task of the fractal geometry, the geometry of nature. It is important to have in mind that in the vortex system, caused by implosion (suction process that causes matter to move inward [3]), the fractal objects – the water molecules - follow a spiral path. This is fully acceptable only if the water molecule is represented as a point or a small sphere. However, we know that water molecule is irregularly shaped, has positive and negative charges, interacts with other water molecules and by moving spiral inward can rotate in any direction.

Figure 1 shows trajectories of water fractal flow in one closed water system (cylindrical vessel). When water molecules implode in the vortex, they follow a spiral path (colored lines) from the top to the bottom. On this path the water fractals gradually increase their velocity and consequently produce higher pressure at the vessel's bottom. Reaching the bottom water fractals release energy, flow radially from the center towards the vessel's rim and further to the top of the vessel. Once on the top, water fractals are yet again ready for the next top-down "fractal vortex path". Such trajectories could also be the solutions of differential equations (Eq. 1) which characterize the whole system. And, it is obvious that such approach enables one to define a new strange attractor, characteristic for water vortex system, called fractado [3].

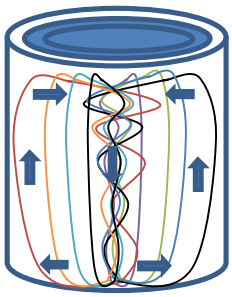

Figure 1 Trajectories of water fractal flow

Following the water molecule path, it is evident that the molecule behaves as an oscillator in a nonlinear dynamical system, which evolves continuously in time and whose evolution can be defined by differential equations of motion [13]. An example of such a system represent the Lorenz equations with two nonlinearities which exhibit both periodic and chaotic motion depending upon values of the control parameters [14].

Similar approach could be applied in the examination of the water vortex flow. Following the suggested projective geometry approach, the path of water molecules from the top to the bottom can be described by the vortex spiral. The flow from the bottom to the top can be assumed to be nonlinear, yet much simpler (parabolic) than the top-bottom path. That way each fractal (water molecule or cluster) produces its own trajectory.

Theoretically developed fractado could be assumed as a simplest presentation of the fractal (water molecule) path. Observing all fractal's motions at the same time, fractado, as a strange attractor, becomes extremely complex, since each fractal depicts its own path. For the mathematical simplicity it is easier to consider only one fractal on its top-down fractal vortex path.

$$\begin{aligned} \frac{dX}{dt} &= f_1(a_1X, b_1Y, c_1Z) \\ \frac{dY}{dt} &= f_2(a_2X, b_2Y, c_2Z) \\ \frac{dZ}{dt} &= f_3(a_3X, b_3Y, c_3Z) \end{aligned} \quad (1)$$

Equation system (Eq. 1) enables the development of a set of soluble partial differential equations with dependent variables (T-temperature, p-pressure, v-velocity, ρ-density) whose solutions can be identified by trajectories (paths of water fractal) in the phase space concentrated onto the attractor (fractado). That way, the estimated numerical values of both equation's parameters and dimensionless numbers ($a_{1,2,3}$, $b_{1,2,3}$, $c_{1,2,3}$) can be the basis for the design of novel technologies.

Request for new technological solutions

Our global concern regarding climate changes arising greatly from unsustainable consumption of fossil fuels seems only to confirm the deepest suspicions of those who believe that something is fundamentally wrong with the current economic theories as well as the prevailing industrial ''forever-growth'' model [15].

The demand for the development of new technological solutions focusing on new energy sources and new water approach is also emphasized in the United Nations Report. We cite: „Energy is at the heart of most critical economic, environmental and developmental issues facing the world today. Clean, efficient, affordable and reliable energy services are indispensable for global prosperity. Access to clean water and sanitation is constrained without effective pumping capacity ..." [16].

An obvious need for new, sustainable and harmonious technologies is today more pronounced than ever before. We are witnesses of serious negative consequences of old technologies for water, forests, different biosystems and the whole life on our planet.

New promising technologies

The movement of matter that creates, develops and purifies the medium is the centripetal motion, and is opposite to explosion; internally it moves towards the center. It is a basis for new technological principles, which can be applied in many areas of human life.

The destructive and dissolving form of motion is centrifugal and forces the moving medium from the center outwards towards the periphery. Nature uses this type of movement to disintegrate complexes that have lost their vivacity or have died [4].

Undoubtedly, there are many challenging topics for the scientific community worldwide in investigations of the water vortex system. Scientific facts obtained through a number of experimental trials should establish the basis for the whole new engineering area - the implosion engineering: an area that offers many interesting and very potent applications in human life. Deeper understanding of the implosion process from the mathematical and engineering point of view should be a good basis for the development of new highly efficient economical equipment and machines (implosion pumps, ship propellers, bioreactors, energy devices, etc.) based on the water flow with inward spiral principles.

By using implosion technology in the near future we have to be prepared for a new range of technological principles that will dominate. Technological changes expected within the implosion engineering can be summarized as follows:

- Our water pipes may no longer be straight but rather spiral.
- Production of electrical energy at home with minimal costs should become reality.
- The cell friendly, drinking water will positively influence our health.
- Transport of fluids (liquids and gases) will become cheaper.
- Explosion motors (today's car's motors) should be converted into implosion motors.
- ... and more ...

Concluding Remarks

Life on our Planet cannot survive ≈9 billion humans' with ''gray'' technologies, especially in the drinking water and energy sector. Here we have discussed some new insights into the vital life molecule, water, and argued that when treated properly, within the fractal mathematics and implosion engineering, applied water flow may turn out to be an optimal solution for a more nature-friendly technological future of mankind.

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