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Advanced Dynamics: Technological Applications

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This paper aims to present a private scientific research project that allows us to propose amazing results in Engineering. This project has been described in the 2018 treaty, **NEW PARADIGM IN PHYSICS**. [1]

It is the result of a scientific investigation developed by the **Advanced Dynamics** team [2], for over 35 years, searching for nomological relations of non-inertial systems. As a result, we have found laws of dynamic behavior in environments where the laws of Classical Mechanics are not applicable.[3]

The aim of this research was to learn the laws of space, analyzing the behavior of those bodies with intrinsic rotation. One of the conclusions is that certain accepted mathematical formulations, do not faithfully show the true dynamic behavior of bodies subject to accelerations by simultaneous non-coaxial rotations.

After several experimental tests, Advanced Dynamics has confirmed, with certainty its dynamic theory, and how to conceive the true development of scientificand technological knowledge in this area of nature.

We have found that we can easily see simultaneous intrinsic rotation and orbiting movements in nature, when until now there was no physical or mathematical model that established a scientific correlation between both movements. We have proposed the aporia that there could be a physical-mathematical correlation between both actions.

It is suggested on **NEW PARADIGM IN PHYSICS** that this new dynamic model can be applied to the mechanics of Saturn's rings, to planetary systems and, in general, to celestial mechanics. [4]

Having reviewed the scientific literature of the last two centuries, we do not find a similar analysis or study on rigid solid systems or bodies subject to external dynamic actions, that generate simultaneous accelerations, that do not coincide in space. Therefore, it can be affirmed that this research work is totally original, and the conclusions that we suggest had not been stated until now.

These proposals would allow the transfer of scientific discoveries to solutions that would improve our technology, our engineering and allow us to enhance new energy sources.

The starting hypothesis, as well as the inferred mathematical formulation deduced, was confirmed by a long series of experimental tests [5]. Other researchers performed other tests, with equally positive results. Based on the equation of motion, a physical-mathematical simulation software was designed.

It is the objective of this paper, to report on the surprising results obtained in this scientific research, and to attract the interest in the exploration of this new area of knowledge, on rotational dynamics, and of its multiple and remarkable scientific and technological applications.

A new criterion has been found applicable in the understanding of the coupling of velocity fields. The innovative dynamic theory that has been developed, based on new concepts such as rotational inertia or field's coupling, has numerous technological applications in accelerated rotation systems.

There are numerous possible technological applications, especially in orbital dynamics, orbit determination and orbit control; one application would be to be able to calculate the trajectory of any solid in space, with intrinsic angular momentum.

Within the technological scope, the theory allows to propose a new steering system independent from a rudder or any other external element. Also, many innovating hypotheses, as for example the analysis of internal strains in moving bodies, due to internal efforts. The concept of dynamic coupling suggests the possibility of performing a power conversion between the terms coupled and in both directions. We can assume that the rotational kinetic energy can be converted into translational kinetic energy, or vice versa, which leads, for example, to conceive the concept of dynamic lever [6].

As a consequence, one might think of a ***dynamic lever****with technological uses and practical effects. This dynamic lever would allow to design mechanisms in which the result of its action could be obtained without any energy consumption, thus the provided energy being recoverable. Apart from designing a dynamic lever or energy conservation devices, the theory gives way to applications in the steering of mobiles in space, f. e. aircrafts or submarines, or also on surfaces, like ships or land vehicles. In this case, the steering devices would be of very easy design and handling. The technological development of this theory allows many uses, including those for leisure.*

In addition to systems for spacecraft governance, the design of a dynamic lever, or the more accurate calculation of

ballistic trajectories, satellites or projectiles with intrinsic rotation, the theory also allows us to envisage energy applications, for example, in the confinement of fusion nuclear reactors, or even the determination of the causes of the devastating effect of hurricanes [7].

In the treaty **NEW PARADIGM IN PHYSICS**, we describe some of the many technological applications that can be derived from the proposed theory [8]:

Dynamic interaction confinementin nuclear fusion reactors [9 &10].

Atmospheric vortex phenomena [11].

Dynamic lever and energy conservation

Steering of mobiles and other devices

Dynamic anomalies in the Pioneer space probes

The dynamic behavior of various examples is also justified in the treaty, and in subsequent papers [12]: Boomerang [13], Conical Pendulum [14], spinning top [15], effects on Ping-Pong balls, effects on golf balls, airplanes roll coupling, epostracism, bouncing bombs, Rolling coin, Euler's disk, etc.

For more information on this theory, and its technological applications, we suggest going to the mentioned books and texts and also visiting the following websites:

https://newparadigminphysics.com/
http://www.advanceddynamics.net/
http://www.dinamicafundacion.com/
http://www.tendencias21.net/fisica/
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