

## Torsion - orientation processes

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The existence of a specific class of orientational processes , due to the potential energy of mutual dependence the location of the axes of rotation of bodies . An analytical expression of the law is proposed conservation of energy , containing members , responsible for the processes and torsion orientation . Underlines , that the spontaneous occurrence of such processes obeys the energy-dynamic criterion of the minimum of ordered energy .

## Introduction

By now, a lot of observations have accumulated in natural science , associated with spontaneous arrangement of relative position rotating bodies . Astronomers were the first to notice this fact . observing the alignment of the rings of Saturn and the orbits of a number of planets in one plane . IN macrocosm, this phenomenon has also been known for a long time and manifests itself , in particular , in a strange behavior of the " Chinese top " - a gyroscope , which , being suddenly inverted 180 degrees , gradually pauses its rotation and then changes it to the opposite with practically the same angular velocity . When researchers became available to monitor the behavior of systems , oriented on the classical back ( own mechanical moment of rotation elementary particles ) , a similar kind of phenomenon was found in the microworld . So , in the first half of the twentieth century, American physicists F . Bloch (1936) and E . Hughes (1947) observed a stronger scattering of neutrons from a magnetized plate with spin orientation , parallel to the magnetic field [1]. In 40-50- years e . Purcell and P . Pound [2], and A . Abraham and Y . Proctor [3] in experiments on nuclear magnetic resonance, the presence of a specific spin - spin interaction , which leads to the establishment of low temperature single orientation of nuclear spins . In 60 years it has been experimentally established , that when neutrons pass through a spin-polarized target, precession of neutrons , whose value is several orders of magnitude higher than that , which could be caused by a magnetic field [4]. In 80 years at the facility to measure Lamb shift revealed unusual features of the interference hydrogen in its different spin states [5] and it was found , that the spin polarization of atomic hydrogen prevents its unification into molecules [6]. At the same time, in experiments with  $^3\text{He}$ , the dependence of its thermal conductivity was found on the state of nuclear spins [7]. In 90 years it has been found also , that the protons spin orientation , the opposite spin of the target , as it were, " pass through " target protons ( without visible interaction ) , while at the same the orientation of the spins in the beam and in the target, their scattering occurs in full in accordance with theoretical concepts [8].

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These and many other experiments indicated the dependence of the energy of the system on its total spin . Since in these experiments only the orientation of the spins , and not their magnitude , we are talking here rather not about torsion interactions , which consist in the transfer of angular momentum of rotation ( acceleration

axial type ), but about a special category of processes that would be appropriate called *orientation* . In [9, 10] , we have shown , that such processes exist at all levels of the universe . From a phenomenological standpoint, they due to the fact , that the different orientation of bodies in respect of not mechanical is equivalent to [11]. However, the study of orientation processes until recently time was spent , in our view , insufficient attention . Interest in them has increased only in recent decades in connection with the search for the so-called " fifth force " - interaction that differs from gravitational , electromagnetic , strong and weak . More often than others, torsion interaction claims this role , attributed to hypothetical fields of inertial forces [12, 13]. Meanwhile, a huge number of facts , the underlying thermodynamics of irreversible processes [14] It suggests , that any real process occurs under the influence of not one , but all forces acting in the system ( Onsager principle ), so that his character and direction is determined by the ratio of these forces and the degree of their involvement in that or another process . This is especially obvious for phenomena at the junction of various scientific disciplines , when these forces have different physical nature . therefore it would be more correct to speak not about some - the " fifth force " generated by anonymous before fundamental interaction , and the specifics of the processes , which arise under the action of already known forces , but lead to specific state changes - ordering the orientation of rotating systems and stationary bodies with shape anisotropy . For reasons , which will become apparent from the below , we will call such processes *torsion - orientation* , if this ordering is associated with the transfer of rotational acceleration to the bodies . Them consideration is advisable to carry out from the standpoint of thermokinetics as a single the theory of the rate of processes of transfer of matter and internal energy [15] and energy dynamics as its further generalization to the processes of transformation of any forms of energy, regardless of their belonging to a particular field of knowledge [16].