

Chapter 7

Incident Conservation Law

ABSTRACT

This chapter first establishes the existence of integral equality in relation to the issue of the transmission of information by elements of lower and higher dimensions in the polytopes of higher dimension that describe natural objects. This integral equality is called the law of conservation of incidents. There is the incidence interpreted as the transfer of information from one material body to another. The fulfillment of the law of conservation of incidents for the n -simplex of the n -cube and the n -cross-polytope is proved in general terms. It is shown that the law of conservation of incidents is valid for both regular bodies and irregular bodies, which can be clusters of chemical compounds. The incident conservation law can serve as a mathematical basis for the recently discovered epigenetic principle of the transmission of hereditary information without changing the sequence of genes in DNA and RNA molecules.

INTRODUCTION

In previous chapters, it was convincingly shown that various objects of the nanoworld have a higher dimension. Geometrically, these objects are convex closed polytopes whose components are geometric elements with a monotonic change of the dimension from zero to the dimension of the polytope. In the monograph “The Geometry of Higher - Dimensional Polytopes” (Zhizhin, 2019a) has studied in detail the geometry of higher - dimensional polytopes, based on an analysis of the structures of chemical compounds (Zhizhin, 2018).

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The monograph (Zhizhin, 2019a) introduced the concept of the incidence coefficients of elements of lower dimension with respect to elements of higher dimension and elements of higher dimension with respect to elements of lower dimension. The first characterizes the number of elements of a certain higher dimension to which the given element of a lower dimension belongs. The second characterizes the number of elements of a given lower dimension that are included in a particular element of a higher dimension. Here we must remember that the vertices of geometric elements of various dimensions are atoms, molecules or functional groups. Therefore, the incidence of geometric elements to a friend means contact between particles of matter, including living matter. The contact between particles of matter can be interpreted as the transfer of information on material structures, including biological structures. The monograph “Attractors and higher dimensions in population and molecular biology: emerging research and opportunities” (Zhizhin, 2019b) showed that the elements of nanostructures of living matter are objects of higher dimension. Information sharing is an inherent property of living beings, without which even primitive organisms would not be able to maintain an extremely delicate balance, which depends on their survival (Mancuso & Viola, 2013; Mancuso, 2017). The monograph (Zhizhin, 2019b) found that DNA, RNA molecules are polytopes of higher dimension, and nitrogenous bases connecting the double helix in the DNA molecule form a cross - polytopes of dimension 13. In this connection, the phenomenon of living organisms associated with DNA modification due to the binding of the methyl group CH_3 to the nitrogenous bases of DNA (methylation). This provides the memory of living organisms, i.e. transfer of inherited traits without changing the sequence of genes in DNA (Mancuso, 2017; Lindquist et al., 2016; Sanbonmatsu et al., 2016). Therefore, it is of interest to study in detail the incidence of the entire polygamy of elements of different dimensions in higher dimension polytopes, considering it as a study of the possibility of transmitting information in biological molecules. This study is devoted to this chapter. It considers all possible incidents in convex bodies, starting with the simplest bodies and gradually complicating them.

INCIDENT CONSERVATION LAW FOR N - SIMPLEX

In n - simplex (Zhizhin, 2013, 2014, 2019 a) the number of elements with dimension d is

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