THE PHYSICAL CERTAINTY OF STABLE REGULARITIES REVEALED BY STATISTICAL QUANTITATIVE DATA

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ABSTRACT

A lot has been written about the problem of loss of definiteness in mathematics over a century. For example, the famous physicist Stephen Hawking put forward the idea of leaving the mathematical formalism: the number of mathematical formulas placed in the article [does not affect their quoting in any way. M. Kline wrote about this in 1984. (Mathematics: Loss of certainty, 434 pp.).

The problem of development of methods of calculus of variations (Hilbert's 23rd problem) still isn't resolved though in this direction it was much made Hilbert. David Hilbert's mathematical activity can conditionally be divided into two multidirectional concepts.

Thus, the axiomatics is cornerstone of both approaches – from the mathematician to the physicist-theorist (the first vector) and, on the contrary, from the experimenter to the mathematician. The approach mathematician-theorist to the development of abstract mathematics, we do not consider. On many examples (more than 100 thousand) statistical (probabilistic) modeling were convinced that the solution of the 23rd problem of Hilbert is found not in mathematics or physics separately, namely in transition from ***experimental physics*** (measurement in physics, astronomy, biology and ecology, sociology and econometrics, equipment and technology) to methods of ***applied mathematics***.

Key to understanding classical mathematics of ***methodology of identification of invariants*** offered by us on real algebraic numerical fields as to results of multiple-factor physical measurements.

But our invariants smooth and nonlinear ***steady laws*** are, including also asymmetric wave functions (wavelet signals) applicable to ***real numerical fields*** (statistical selections). Thus not only time, but also each physical factor can be accepted to the explaining variable.

Further we will give an example of identification of four-membered model. In total 43 days of measurements give hourly dynamics in time in $43 \times 24 = 1032$ hours (fig. 1) on the second component (the first - the trend).

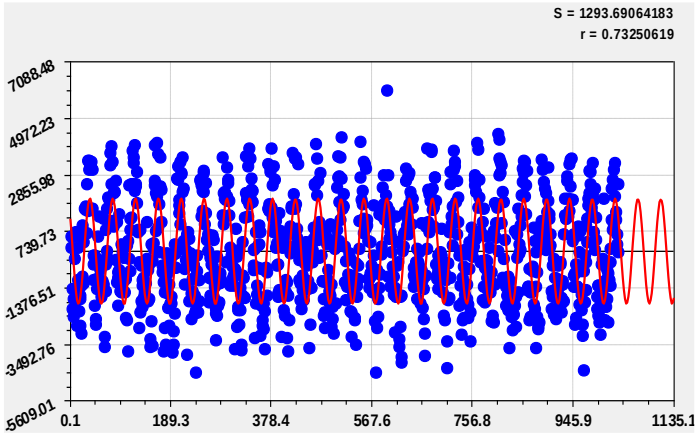

Figure 1: Dynamics of quantity of increments of hour impulses of alpha decay on hours in 43 days of a solar eclipse

RECENT PUBLICATIONS

1. P.M. Mazurkin, Asymmetric Wavelet Signal of Gravitational Waves. *Applied Mathematics and Physics*, vol. 2, no. 4 (2014): 128-134. doi: 10.12691/amp-2-4-2.
2. P.M. Mazurkin. Identification of wave regularities according to statistical data of parameters of 24 pulsars. 2016. 15 p. Doi 10.18411/d-2016-156.
3. P.M. Mazurkin. Method of identification. *International Multidisciplinary Scientific GeoConference, Geology and Mining Ecology Management*, SGEM, 2014, 1(6), pp. 427-434. https://www.scopus.com/inward/record.uri?eid=2-s2.0-84946541076&partnerID=40&md5=72a3fcce31b20f2e63e4f23e9a8a40e3
4. P.M. Mazurkin. Wavelet Analysis Statistical Data. *Advances in Sciences and Humanities*. Vol. 1, No. 2, 2015, pp. 30-44. doi: 10.11648/j.ash.20150102.11.
5. P.M. Mazurkin. Invariants of the Hilbert Transform for 23-Hilbert Problem, *Advances in Sciences and Humanities*. Vol. 1, No. 1, 2015, pp. 1-12. doi: 10.11648/j.ash.20150101.11.

Biography

Doctor of Technical Sciences, Professor, Head of the Chair of Environmental Engineering at the Volga State Technological University. Specialist in modeling quantum states of objects by asymmetric wavelets with variable amplitude and period of oscillations. A total of about 1600 publications, 53 of them are monographs, 26 teaching aids, 296 inventions.