MATHEMATIC PHANTOMS OF PHYSICAL FORMULAS

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The physical laws are expressed in the form of mathematic correlations between physical quantities. For better visualization, several formulas (equations) are presented as the examples of how the well-known physical formulas (equations) will look like after their transformation using full-parallel solution (FPS method).

For example, the second Newton's law can be mathematically expressed by the following formula: $F = m \cdot a$.

Force F is equal to mass m multiplied by acceleration a.

By transforming the formula $m \cdot a = F$ using FPS method, we will get:

$$m^2 + [(m-m) + (a-m) - 1]m + [(m-m)(a-m) - (F-m)] = 0,$$
$$a^2 + [(m-a) + (a-a) - 1]a + [(m-a)(a-a) - (F-a)] = 0,$$
$$F^2 + [(m-F) + (a-F) - 1]F + [(m-F)(a-F) - (F-F)] = 0. \quad (1)$$

The coefficients given in square brackets of the equations (1) include the «dynamic constants» $m-m$, $a-m$, $F-m$, $m-a$, $a-a$, $F-a$, $m-F$, $a-F$, $F-F$ and «1».

As we can see, three equations (1) are being the second-degree reduced algebraic equations from one unknown. The second-degree equations from one unknown have two solutions (two roots).

Therefore, the formula $F = m \cdot a$ has two solutions:

- the first solution is real;
- the second solution represents the mathematic phantom of the real solution.

The mathematic phantoms of physical formulas (equations) act as the non-first solutions of physical formulas (equations).

The term «mathematic phantom» is common. This term is applicable in physics in respect of not only mechanics but also electrical, atomic, nuclear, wave phenomena, etc.

The formula $F = m \cdot a$ has two solutions: one is real, and another is the mathematic phantom of the real solution. Both solutions of the physical formula are equivalent. The mathematic simulation of real processes and mathematic simulation of mathematic phantoms of real processes are equally possible.

References

1. Smolygin V.D. Mathematic phantoms of physical laws (formulas) (formula phantoms of physics) // United scientific journal № 5. Moscow: Scientific publications' fund. 2009. P. 83-88.