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STUDYING THE TRANSITION PROCESSES IN PHYSICS LESSONS

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Annotation
The use of exposure in modeling various physical processes with the help of numbers is one of the most effective. This method is much more convenient, especially if you represent the results in the form of tables or graphs in laboratory exercises.

Keywords: Physical, parameter, experiment, measurement, oscillator.

Introduction

It is necessary to measure that the physical size varies over time, depending on different parameters. The relevant parameters are changed, the experiment is repeated several times, and the results are compared and a conclusion is drawn about the process under study. However, it is natural that the results obtained may not reflect the actual process under study, since the accuracy of the measuring instruments intended for educational Laboratories is quite low and their performance is influenced by various external factors.

This makes it difficult to formulate a physical law from the results obtained. Comparing the results of the experiment with the quantitative calculation of the law, which expresses the physical process, it becomes easier to evaluate the results, and at the same time, the measurement error is clarified. But the calculation of sizes, which depends on several parameters, will take much more time. If this work is done with the help of exposure, then in a short time it will be possible to repeat the theoretical calculations several times for different cases. This will allow you to fully achieve the desired goal from the laboratory training.

1-Example: consider the movement of a bundle of interrelated bodies of oscillators. The vibration of the system is affected by the environment, the amplitude of its vibration decreases, that is, the vibrations are extinguished. If the oscillations fade

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slowly, and its amplitude is small, the oscillations that fade can be considered prop, the resistance force of the environment is proporsional to the speed of the system.

$$F_q = -\mu\frac{dx}{dt} = -\mu x'.$$

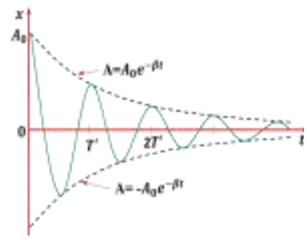
The oscillatory system is also affected by the quasi-elastic force equal to F_kϑ= - kx. The equation of motion of the quenching oscillating system can be written as follows

$$:mx'' = -\mu x' - kx$$

furthermore $mx'' + \mu x' + kx = 0$ formulate and divide the equation by m, $\frac{\mu}{m} = 2\beta$ va $\frac{k}{m} = \omega^2$ by entering a definition, we write the equation of motion of the system as follows:

$$x'' + 2\beta x' + \omega^2 x = 0$$

Here β - coefficient, ω – frequency of cycles



This expression is called the differential equation of fading oscillations. Solution of such equations $x = A_0e^{-\beta t}\cos(\omega t + \varphi_0)$ (1)
expressed in appearance. Here

$$A = A_0e^{-\beta t}$$

the expression is a vibration amplitude, which decreases according to exponential law. the change in the x coordinate (1) is based on the equation, in the form of a graph given in Figure 1.

2- example: let's consider the processes of studying the phenomenon of self-induction. A change in the current passing through the contour creates in itself an Euok, as a result of which an additional current is formed in the contour, this current is called an extra current of the loop. The direction of the self-induction ekstra current can be found according to the Lens Rule.

Inductance to the source when the coil is connected, the extra current generated in it resists the source current to reach the maximum value. The direction of the extra Tokens formed in the chain is the opposite direction to the direction of the current of the source from which it formed itself.

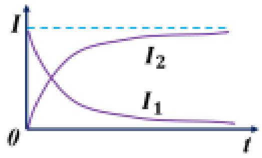
Consider a chain consisting of a current source whose inductance is L R of resistance to the reel, which is a resistor, Yi. In place of resistor resistance, it is also possible to obtain the active resistance of connecting wires and coils.

When the chain is disconnected, the current in it decreases over time under the exponential law I_1=I_0 e^(-t/τ) (2)

I_0=ε / R the maximum current generated in the chain. τ=L / R - the time when the current went to e times decrease.

When the chain is connected, the current strength increases as follows:

I_2=I_0 (1-e^(- t/τ)) (3)
In this case, the current strength increases from the initial I=0 value to the maximum I_0=ε/R. The speed of change of the current strength depends on the τ-time of relapse.
The smaller the inductance of the chain L, and the greater the resistance of the R asset, the greater the change speed of the current.
Calculations are performed according to the program. 2-in the example, the program calculates the time reduction and increase values of a current in a certain inductive coil for three values of a voltage and resistance of a power source as a table, and based on this table, the i_1 and I_2 current changes
Graf takes a graphic displayed on the screen (picture 2).



3- example: we consider the transition processes in the capacitor chain. How long is it charged if the C capacitor is connected to the u_0 constant voltage source by means of R resistance? When the capacitor is connected to the source, the voltage in it increases, the current in the chain decreases. The voltage in the capacitor will continue to charge until the voltage of the source is equal to U_0. In the capacitor coatings, the required q_0=CU_0 the current passing through the chain stops when the charge is collected, thereby ending the charging process.
If we represent the charge in one of the plates with q, then in the process of charging the capacitor it changes. The rate of change of charge on the plate is dq/dt, represents the current in the chain:

$$\mathbf{I = dq/dt}$$

The sum of the resistance U_R and U_C voltages in the capacitor in the chain connected in series is equal to the voltage of the source U_0. From this, the voltage in the resistor is equal to the resistance multiplied by the current

$$\mathbf{IR + U_C = U_0}$$

expression is formed.
Given that the expression of the current Power (1) depends on the rate of change in the charge, and the u_c voltage in the capacitor is Q/C at the optional time, we get:

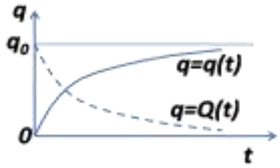
$$\mathbf{R\frac{dq}{dt} + \frac{q}{C} = U_0}$$

This differential equation is the function of q(t), which depends on the time of the capacitor charge. The given U_0 voltage of the capacitor is equal to the ratio of the resulting charge to the capacity of q_O: U_0=q_0/C.

$$\frac{dq}{dt} = \frac{(q_0 - q)}{RC}$$

If we represent the charge q_0-q on the plate with a new Q magnitude, then this equation can be easily transferred to another view: Q=q_0-q and if we differential it, we form dq/dt=-dQ/dt. Given this, it is possible to write (4) as follows:

$$\frac{dQ}{dt} = -\frac{Q}{RC}$$



Picture 3

solution of this equation

$$Q(t) = CU_0 e^{-\frac{t}{RC}} \quad (4)$$

$Q = q_0 - q$ if we pay attention to the expression

$$q(t) = CU_0\{1 - e^{-\frac{t}{RC}}\} \quad (5)$$

(4) and (5) function charts will have the following appearance.
Calculations are performed on the basis of a program written for (4) and (5) formulas. In the example, the program is known for the three values of the voltage and resistance of a u_0 of a power source, and the charge of a capacitor C is calculated as a table of the values of the decrease and increase in time, and based on this table, the graph of the change in q_1 and q_2 In this work, it is proposed to study the transition process by quantitative calculation. The program can be used in the organization of laboratory work of Electrical and electrotechnical courses.

References

1. Sadriddinav.N, Rahimov.A, Mamadaliyev.A, Jamolova.Z. "Method of teaching physics basics". TASHKENT - "UZBEKISTAN" - 2006.
2. Minamatov, Y. E. O. G. L., & Nasirdinova, M. H. Q. (2022). APPLICATION OF ICT IN EDUCATION AND TEACHING TECHNOLOGIES. Scientific progress, 3(4), 738-740.
3. Minamatov, Y. E. U. (2021). APPLICATION OF MODULAR TEACHING TECHNOLOGY IN TECHNOLOGY. Scientific progress, 2(8), 911-913.
4. Kasimakhunova, A. M., Zokirov, S. I., & Norbutaev, M. A. (2019). Development and Study of a New Model of Photothermogenerator of a Selective Radiation with a Removable Slit. Development, 6(4).
5. Mamadalieva, L. K., & Minamatov, Y. E. (2021). High Efficiency of a Photoelectric Converter in a Combined Design with a Thermoelectric Converter. Middle European Scientific Bulletin, 19, 178-186.