## ABSTRACT

Master dissertation: 100 p., 16 ppic., 1 tabl., 1 Add., 80 ref.

**Actuality**. Development of technical civilization on the Earth in the XX century. characterized by a rapid increase in power consumption. It is estimated that in 1945-95 pp. The population of the planet used 2/3 of all fuel extracted by mankind during its existence. Such rapid rates of energy development have led to the emergence of a number of acute problems.

The problem of resource availability of the energy economy comes to the fore. On the one hand, the total reserves of fuel resources are quite large, and, moreover, new deposits of fossil fuels become known every year. In addition, modern technology provides access to the use of non-traditional energy sources; this suggests that there is still no absolute energy shortage on the planet. On the other hand, relative resource constraints are observed, due to the possibility of rapid exhaustion of the most accessible fields, and the transition to more complex development, which leads to a rise in price of energy resources and makes the use of most of the fuel resources unprofitable. Analysts predict the approaching moment when energy expenditures on exploration and extraction of the main type of fuel - oil - outside of the Middle East will exceed the amount of energy that can be obtained from it.

Many solutions are proposed for solving it in the form of energy saving technologies and the use of renewable sources, and one of the most promising but very remote from the practical introduction of replacement of current power plants is fusion. The experiment, which reproduces similar to terrestrial magnetic fields, confirms the potential of a new way of creating a reactor for energy production by fusion of nuclei - the same reaction that occurs on the Sun.

**Connection with academic papers, plans, themes.** The work was done at the branch of the department of automated data processing systems and

management at the V.M. Glushkov Institute of Cybernetics NAS of Ukraine within the research topic "Mathematical Modeling of Magnetic Suspension System in Nuclear Fusion Reactor" (state registration: 0114U002091).

**The goal of the research** is to improve the quality of the thermonuclear reactor LDX by simulating the magnetic suspension and determining the zones of stability where it operates normally and the cost of its maintenance is minimal.

To achieve the goal the following **task** should be performed:

- simulate the work of the magnetic suspension;
- choose the best options for work;
- implement and analyze the work of the suspension, depending on its parameters;
- offer parameters that would improve the work of the magnetic suspension;
- determine the effectiveness of the solution;

**The object of the research** is the process of magnetic suspension.

**Subject of the research** is parameters of the magnetic suspension LDX.

**Research methods**, applied in this work, are based on methods of studying processes by creating their mathematical models and studying these models.

LEVITATED DIPOLE EXPERIMENT, MAGNET, SYNTHESIS, DIPOLE, CHAMBER, PLASM.