Ермолаева Мария М05-916в

**Rus-Eng 2**

ANALYSIS OF THE THE PROGRAMMING LANGUAGE

JAVA APPLICABILITY IN THE ELECTRIC IMPEDANCE TOMOGRAPHY TASKS

Software development for solving electrical impedance

tomography (EIT) problems suggests the presence of a number of difficulties associated with the specifics of this direction [1-8].

The main software requirements for this area are:

- high accuracy of calculations;

- the ability to visualize data arrays;

- ease of use;

- statistical data processing:

- accounting of patients;

- maintaining a history of research results.

An analysis of the application possibility was made to solve the problems.

Java programming language [9], its standard components and syntax, as well as

extensions of the basic functionality using third-party libraries.

Java software development has the following advantages:

- cross-platform;

- simplicity and low cost of development;

- A large community of developers;

- low entry threshold:

-the presence of a large number of ready-made solutions;

-good documentation in Russian;

- the possibility of developing software from under Linux [10].

To carry out research and analysis of the language features, was used the freely distributed development environment NetBeansIDE [11].

NetBeans IDE - free Integrated Development Environment (IDE) for applications

in the programming languages ​​Java, Python, PHP, JavaScript, C, C ++ and several others. The NetBeans project is created and sponsored by Oracle, but NetBeans is being developed by an independent community of enthusiastic developers (NetBeans Community) and NetBeans Org. For full-fledged application development, you must have the pre-installed Sun Java Development Kit or J2EE SDK.

During the analysis of the possibility of using ready-made Java solutions for EIT tasks, the following libraries were investigated and studied.

CoomonsMath 3 is an easy-to-use library for implementing mathematical and statistical calculations that are not part of the standard features of the Java language. It allows calculate variance, standard deviation, median, minimum and maximum. For use does not require third-party dependencies [12].

XChart 2.5 - the library allows you to implement various graphical representations

data, such as bar charts, line charts, or pie charts. Library easy to use and has no third-party dependencies [13].

Apache POI - a library designed to work with documents such as Word and Excel. This library makes it easy to read and write files with regulated markup. The library requires an additional dependency [14].

Thus, due to the possibility of using ready-made solutions, the Java language

allows you to solve the problems of EIT. The main advantages of this solution is

cross-platform, low entry threshold and a large community of developers.

The work is carried out under a grant of the President of the Russian Federation for

state support for young Russian scientists MK 4856.2015.8