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Development of software for automatic sample changing during gamma spectrometry of a large number of samples

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Instrumental neutron activation analysis is performed at the REGATA facility of the IBR-2 reactor. The main stages of the analysis are samples preparation and irradiation, acquisition and processing of gamma spectra, and analysis of the data obtained. Four pairs of KUKA KR10 R1100 robotic manipulators and Canberra DSA-LX multichannel analyzers are used to automate the acquisition of gamma spectra of irradiated samples. This set of devices allows simultaneous measurement of eighty-one samples on one detector without operator intervention. Special software has been written to control these devices, perform an automatic sample changing and acquisition of gamma spectra.

The main stages of software development include writing class libraries for controlling KUKA KR 10 R1100 robotic manipulators and Canberra DSA-LX multichannel analyzers and creation of user graphical interface. The development was carried out in the object-oriented programming language C# using the .NET Framework. This combination of programming tools will allow to run the application on Windows PC and make modifications to apply new functional and hardware features. The graphical shell was made using the UI framework Windows Forms.

The software application allows to work simultaneously with a selected number of "detector-robot"pairs, transmit measurement information to the database and save locally spectrum files.

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