

Multipoint temperature measurement as a way to measure the energy produced inside an ADS reactor

Project supervisor:

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Goal:

In the nuclear processes the main interest is the level of energy production. The key issue in the design of nuclear reactors is knowledge of the value of energy released, both for safety reasons and energy efficiency of the system. One of the methods of determining this value is a multi-point measurement of temperature change. The goal of this project is to design a measuring system that solves the problem described, followed by building of the measuring device, developing software for it, and performing real temperature measurements. We use temperature sensors of type Pt 100, and LUMEL measurement modules. The set should be programmed for online working with the computer control. We will use the LabView environment for it.

Project description:

1. Discussion of the issue of ADS reactors and temperature measurement.
2. Participation in the experiment (provided it takes place during the practice), and visit to the experimental site and the accelerators site.
3. Construction of an electronic measuring system (based on ready-made components) based on PT100 platinum sensors and the RS-485 protocol.
4. Development of the measuring system software (or upgrading of the existing software) using the LabView environment.
5. Calibration of the measuring system.
6. Temperature measurements, normalization of the results and their comparison with other results - practical analysis of the obtained results.
7. Preparation of student's speech at the end of the practice and for the conference after that, and preparation of a publication together with the practice supervisor based on the obtained results.

Requirements for the students:

- The subject is addressed to students interested in electronics, practical measuring systems, and nuclear physics.
- Basic knowledge of electronic layout.
- Basic skills in using Excel program and the LabView environment.

Number of participants: up to 4 students.