# Measurement of the time of flight of charged particles using the MCP detector

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**Abstract.** Experiments on the beams of the radioactive isotopes is the direction of nuclear physics, which is currently intensively developed. The use of such beams for the researching modern nuclear physics is accompanied by some tasks, such as obtaining the required intensity of beams, accelerating them to the required energy and registering the products of the nuclear reactions. Recording and further studying the obtained results, due to the complexity of experiments of a similar level (a large variety of reaction channels, the presence of neutron and gamma background, etc.), places a special demands on the characteristics of the data acquisition equipment. Under these conditions, one of the most accurate methods for determining the energy of a particle is the time-of-flight method, in which the energy is determined by measuring the time of flight of a particle at a given distance.

An important element of the time-of-flight technique is the start detector, which must have a high temporal resolution, minimal stopping losses when registering heavy reaction products, low sensitivity to the background of light particles and resistance to radiation damage. In our work, the MCP-detector (a detector based on microchannel plates) was chosen as the starting detector. As the primary test results for this setup, a time resolution was obtained.

The results of such studies are of practical importance for modern nuclear physics measurements. In particular, it is possible to use the electronic equipment described in the work as part of the data collection system of a nuclear physical installation.