MCP based detectors for registration of circulating accelerated beams and single charged and neutral particles

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The results of development and practical implementation of detector systems for circulating beams of the accelerator complex NICA (LHEP JINR) are presented. The advantages and disadvantages of detectors based on MCP (Microchannel Plates) are discussed. The specific features of MCP chevron assemblies, their characteristics, as well as various signal readout systems, are demonstrated. The report is illustrated by a wide range of experimentally registered dependencies obtained during the operation of these systems in the internal vacuum chambers of the Booster and Nuclotron accelerators of the NICA complex. A new type of detector for registering thermal neutrons based on a radiator made of boron-10 isotope and a chevron microchannel plate assembly is presented. Optical image registration systems using a luminophore screen of this neutron detector and various types of CMOS matrices are discussed.