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MCP-Based Detectors for Diagnostics of Circulating Beams in the NICA Accelerating Complex

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A promising diagnostic system for circulating beams based on microchannel plates (MCP) is presented in the framework of implementation of the NICA project. The profile monitors developed, manufactured and tested in Nuclotron and Booster provide measurements in a range of intensities of single-charged ions from 10^3 to 10^8 which is not covered by other existing measurement equipment. The experimental data on space-time characteristics of beams from single-charged to heavily stripped ions are presented. The loading and time characteristics, as well as the advantages and disadvantages of MCP-based detectors are discussed. Another application of MCP-based detectors is a measurement of small-angle scattering in the SPD experiment at the NICA collider. The advantages of such detectors are precise determination of the interaction vertex and sub-nanosecond time resolution. Both were experimentally demonstrated.

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