

The MPD Detector for the NICA heavy-ion collider at JINR

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The new heavy-ion program launched recently at JINR (Dubna) is devoted to the search for signals of de-confinement phase transition, chiral symmetry restoration and the QCD critical endpoint. The future high luminosity accelerator facility NICA will supply ion species ranging from proton to Au ions in the region of the collider energy up to $\sqrt{s_{NN}}=11$ GeV. In order to achieve the NICA full scientific potential the experiment is required to have almost 4π acceptance, excellent tracking and identification capability in high multiplicity environment.

The proposed MPD detector design includes a Time-Projection Chamber inside a superconducting solenoid as a main tracking device. An silicon Inner Tracker consisting of the microstrip detectors is designed to enhance vertex reconstruction capability. Particle identification is achieved using a Time-of-Flight detector based on the Resistive Plate Chamber technology. Most electrons and photons will be identified in a barrel Shashlyk-type electromagnetic calorimeter. A sampling Zero Degree Calorimeter will be used for event characterization.

In this talk, after a survey of the key technical features of the NICA project, a conceptual design of the MPD apparatus will be presented. In the following, we report on recent results of the MPD R&D program and progress in the development of the reconstruction algorithms. Finally, an outlook of the status of the NICA complex and the MPD detector construction plan will be given.

Summary (Additional text describing your work. Can be pasted here or give an URL to a PDF document):

We have presented the complete detector concept for the NICA heavy-ion collider at JINR. We have demonstrated that the proposed MPD apparatus allow us to meet basic performance requirements for measurements of hot and dense QCD matter in relativistic heavy-ion collisions at NICA.

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