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Status of the MPD experiment at NICA

PONENTE:

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The Nuclotron-based Ion Collider fAcility (NICA) is a mega-science project under development at the Joint Institute for Nuclear Research in Dubna, Rusia; Its main goal is to study hot and dense strongly interacting QCD matter and to search for a mixed phase and the critical end point in the QCD phase diagram. NICA will collide ion beams (up to Au+79) with an average luminosity of $L = 10^{27}\ cm^{-2}s^{-1}$ in the energy range from $\sqrt{s_{NN}}$ = 4−11 GeV, as well as beams of polarized protons ($\sqrt{s_{NN}}$ up to 26 GeV) and deuterons ($\sqrt{s_{NN}}$ up to 12 GeV). The facility includes the fixed target experiment Baryon Matter at Nuclotron BM@N, the collider facilities Multi Purpose Detector (MPD) and Spin Physics Detector (SPD) experiments and the ARIADNA (Applied Research at the NICA) project. It is expected that the technological start-up of the complex and the first ion collisions will take place in the middle of 2025. The MPD experiment will run with heavy-ion collisions within the center of mass $\sqrt{s_{NN}}$ energy range from 2.4 to 3.5 GeV in fixed target mode and from 4 to 11 GeV in collider mode. This will make possible to shed light on a poorly studied region of the phase diagram and to test predictions of non-perturbative QCD and other theoretical models describing strongly interacting matter. In this talk I will review the status of the MPD experiment and the feasibility physics studies in preparation for the first data taking that will take place in 2026. Also I will talk about the joint efforts between JINR and a group of Mexican scientists. In particular the development of the miniBeBe, a trigger detector proposed to work during stage zero of the MPD operation, and its contribution to the second collaboration paper.

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