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Status of the BM@N experiment at NICA/Nuclotron

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The BM@N (Baryonic Matter at Nuclotron) is the first fixed-target experiment performed at the NICA-Nuclotron accelerator complex. In central heavy nucleus-nucleus collisions at the Nuclotron beam energies, baryon densities of 4-5 of the saturation density are reached. The primary goal of the experiment is to constrain parameters of the equation of state of high-density nuclear matter and search for the onset of the deconfinement phase transition. The main aspects of the physics program of the experiment and the relevant observables are discussed. Previously, the experiment recorded the first data in carbon-nucleus and argon-nucleus interactions at beam kinetic energies from 3.2 to 4.5 GeV per nucleon. In 2023 the physics run was performed with a xenon beam of 3.8 A GeV and 3.0 AGeV. The experiment recorded over 550 million Xe+CsI interactions in a full set of detectors. The experiment is currently on its way to studying relativistic interactions of heavy nuclei up to Bi+Bi. First physics results of the experiment are presented on the yields of charged π^+ , K⁺, proton, deuteron and triton yields and their ratios in argon-nucleus interactions at a beam kinetic energy of 3.2 AGeV. Preliminary results on the production of Lambda, K₀s and the measurement of direct collective flow of protons in Xe+CsI interactions are also discussed.

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