

5 Countries, 13 Institutions, 214 participants

- *University of Plovdiv, Bulgaria*
- *St.Petersburg University*
- *Shanghai Institute of Nuclear and Applied Physics, CFS, China;*
- *Joint Institute for Nuclear Research;*
- *Institute of Nuclear Research RAS, Moscow*
- *NRC Kurchatov Institute, Moscow combined with Institute of Theoretical & Experimental Physics, NRC KI, Moscow*
- *Moscow Engineer and Physics Institute*
- *Skobeltsyn Institute of Nuclear Physics, MSU, Russia*
- *Moscow Institute of Physics and Technics*
- *Lebedev Physics Institute of RAS, Moscow*
- *Institute of Physics and Technology, Almaty*
- *Physical-Technical Institute Uzbekistan Academy of Sciences, Tashkent*
- *High School of Economics, National Research University, Moscow*



BM@N papers, preliminary results, conferences



The BM@N spectrometer at the NICA-Nuclotron facility

The BM@N detector paper for the Xe+CsI run configuration, published in NIM A, NIMA 1065 (2024) 169532, arxiv:2312.17573

Production of p , d , t in 3.2 AGeV argon-nucleus interactions at the Nuclotron, BM@N preliminary, extension of the paper draft

Directed flow v_1 of protons in the Xe+Cs(I) collisions at 3.8 AGeV, BM@N preliminary

BM@N presented / submitted physics and detector talks at conferences:

Conference Nucleus-2024, Dubna, July 2024

Conference "Hadron Structure and Fundamental Interactions" - HSFI'2024, Gatchina, July 2024

Conference ICPPA-2024, Moscow, October 22-25

Current activities and tasks for the Xe data analysis



- Good agreement between data and reconstructed Λ and K^0_S simulation (A.Zinchenko, V.Vasendina, J.Drnoyan)
- Identification of charged particles in ToF-400 and ToF-700 (M.Rumyantsev, I.Zhavoronkova, S.Merts, N.Huhaeva, V.Plotnikov)
 - ToF-700 reconstruction and alignment is not finished yet
- Search for signals of light hyper-nuclei $_{\Lambda}H^3$, $_{\Lambda}H^4$ and ϕ -meson (S.Merts, R.Barak)
- Analysis of v_1 and v_2 flows for protons and Λ , centrality measurement based on track multiplicity (MEPhI group)
 - Centrality measurement in fragment hodoscope and hadron calorimeter is not done yet (INR RAS)
 - Need to compare the results of two methods
 - Need to evaluate trigger efficiency in data for different centrality classes
- **Topics of physics analyses:**
 - analysis of production of Λ hyperons, K^0_S , K^{\pm} , π^{\pm} , ϕ mesons, light nuclear fragments and neutrons in Xe+CsI interactions;
 - analysis of collective flow of protons, π^{\pm} , Λ , light nuclear fragments
 - femtoscopy of π^{\pm} , protons, light nuclear fragments
 - Analysis of light hyper-nuclei $_{\Lambda}H^3$, $_{\Lambda}H^4$

Physics run with the Xe beam in 2025

- beam energy scan in the range of 2-3 AGeV
- same central tracker configuration based on silicon FSD and GEM detectors,
- additional 1st vertex plane of silicon STS detectors
- complete replacement of outer drift chambers with cathode strip chambers
- additional ToF-400 modules to extend acceptance by factor 1.5

Preparations for the physics run with the Bi beam

- further development of the central tracker is foreseen: installation of an additional station of silicon FSD detectors
- It is planned to put into operation a 2-coordinate (X/Y) neutron detector of high granularity to measure neutron yields and collective flow

Contributions of Institutions to the BM@N Common Fund in 2024

Institution	Participants eligible for CF	CF contribution in 2024 plan	CF contribution in 2024 fact
University of Plovdiv	1	50 K RUB	In-kind
Fudan Uni, Shanghai	3	150 K RUB	MoU is not signed
IPT, Satbayev University, Almaty	2	100 K RUB	MoU is not signed
INR RAS, Moscow	4	200 K RUB	In-kind
Kurchatov Inst., NRC, Moscow	4	200 K RUB	In-kind
LPI RAS, Moscow	2	100 K RUB	In-kind
MEPhI, Moscow	5	250 K RUB	250 K RUB
MIPT, Moscow	2	100 K RUB	50 K RUB + in-kind
SINP MSU, Moscow	5	250 K RUB	In-kind
SPBU, St Petersburg	1	50 K RUB	In-kind
HSE University, Moscow	1	50 K RUB	MoU is not signed
PhTI of UzAS, Tashkent	5	250 K RUB	In-kind

Contribution 2021 – 2024

Institution	2021	2022	2023	2024
University of Plovdiv	---	50 000 PILOT PROGRAM	In-kind	In-kind
Fudan Uni, Shanghai	---	---	---	---
IPT, Satbayev University	---	---	associate member	MoU is not signed
INR RAS, Moscow	---	150 000 RUB PILOT PROGRAM	150 000 RUB PILOT PROGRAM	In-kind
Kurchatov Inst., NRC, Moscow	---	100 000 PILOT PROGRAM	200 000 RUB PILOT PROGRAM	In-kind
LPI RAS, Moscow	---	---	150 000 RUB PILOT PROGRAM	In-kind
MEPhI, Moscow	200 000 RUB	250 000 RUB	250 000 RUB	250 000 RUB
MIPT, Moscow	50 000 RUB	In-kind	100 000 RUB PILOT PROGRAM	50 000 + in-kind
SINP MSU, Moscow	---	---	250 000 RUB PILOT PROGRAM	In-kind
SPBU, St Petersburg	---	150 000 PILOT PROGRAM	50 000 RUB PILOT PROGRAM	In-kind
HSE University, Moscow	XXX	XXX	XXX	MoU is not signed
PhTI of UzAS, Tashkent	XXX	XXX	XXX	In-kind

Total (2021–2023): 945 000 rub (transfer) + 1350 000 rub (Pilot Program)

Expenditure in 2024 (12th Collaboration Meeting) - 945 000 rub

Incoming in 2024: 250 000 (MEPHI) + 50 000 (MIPT) = 300 000 rub