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Status of the Time of Flight System of the Mpd Experiment at the Nica Collider

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NICA (Nuclotron-based Ion Collider fAcility) is a new accelerator complex designed at the Joint Institute for Nuclear Research to study properties of dense baryonic matter. Two interaction points are foreseen in the NICA collider: one for studying the collision of heavy ions on the Multipurpose detector MPD, the other for polarized beams for the experiment on the SPD installation. The ambitious physical goals of MPD require excellent particle identification at the maximum possible range of phase space. Identification of charged hadrons is achieved by combining time-of-flight measurements and dE/dx energy loss measurements from the time-projection camera TPC.

TOF will provide:

- large pseudorapidity region of $|\eta| \leq 1.2$;
- high granularity to keep the overall system occupancy below 15% and minimize efficiency degradation due to double hits;
- good position resolution to ensure efficient matching of hits in the TOF system with TPC tracks;
- high geometrical efficiency and detection efficiency;
- identification of pions and kaons with $pt < 1,5$ GeV/c;
- identification of (anti)protons with $pt < 3$ GeV/c;
- function of TOF detector elements in a 0.5T magnetic field.

The time-of-flight system is based on multigap resistive plate chambers (MRPC), which are successfully used to identify particles in similar experiments around the world. A production site has been organized at the Laboratory of High Energy Physics of JINR for serial production of TOF MPD modules. This site includes the entire cycle of work from preparing materials for the assembly of detectors to testing the assembled modules on cosmic radiation.

The structure of the TOF system, its main parameters and the current state are presented. The results of decoding and processing the data obtained at the module testing facility are also presented.

Primary author(s) : BARYSHNIKOV, Victor (Joint Institute for Nuclear Research, Joliot-Curie st. 6, Dubna, Russia. physics Department, M.V. Lomonosov Moscow State University, Leninskie Gory, 1-2, Moscow, Russia.); BABKIN, Vadim (Joint Institute for Nuclear Research, Joliot-Curie st. 6, Dubna, Russia); BUZIN, Svyatoslav (Joint Institute for Nuclear Research, Joliot-Curie st. 6, Dubna, Russia); BURDYKO, Aleksandr (Joint Institute for Nuclear Research, Joliot-Curie st. 6, Dubna, Russia); BURYAKOV, Mikhail (Joint Institute for Nuclear Research, Joliot-Curie st. 6, Dubna, Russia); GOLOVATYUK, Vyacheslav (Joint Institute for Nuclear Research, Joliot-Curie st. 6, Dubna, Russia); DMITRIEV, Alexander (Joint Institute for Nuclear Research, Joliot-Curie st. 6, Dubna, Russia); DULOV, Petar (Joint Institute for Nuclear Research, Joliot-Curie st. 6, Dubna, Russia. Faculty of Physics and Technology, Plovdiv University "Paisii Hilendarski", Plovdiv, Bulgaria.); RUMYANTSEV, Michael (Joint Institute for Nuclear Research, Joliot-Curie st. 6, Dubna, Russia. Dubna State University, Universitetskaya st. 19, Dubna, Russia.); SMOLYANIN, Timofey (Joint Institute for Nuclear Research, Joliot-Curie st. 6, Dubna, Russia); DRONIK, Vitaly (Laboratory of

Advanced Radiation Research of the National Research University "BelSU"); KIDANOVA, Ekaterina (Laboratory of Advanced Radiation Research of the National Research University "BelSU"); PYATIGOR, Artem (Laboratory of Advanced Radiation Research of the National Research University "BelSU"); VOKHMYANINA, Kristina (National Research University "BelSU")

Presenter(s) : BARYSHNIKOV, Victor (Joint Institute for Nuclear Research, Joliot-Curie st. 6, Dubna, Russia. Physics Department, M.V. Lomonosov Moscow State University, Leninskie Gory, 1-2, Moscow, Russia.)

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