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Time-projection chamber development for Multi-Purpose Detector of NICA project

Under the JINR scientific program on study of hot and dense baryonic matter, a new accelerator complex the Nuclotron-based Ion Collider fAcility (NICA) is under construction. The Multi-Purpose Detector (MPD) will operate at one of the collider interaction point and it is optimized for investigations of heavy-ion collisions in energy range from 4 to 11A GeV.
TPC is proposed as central part of tracking system of the MPD detector. It is the natural choice for three-dimensional imaging of complex events in heavy-ion experiment. In conjunction with the time of flight and inner tracker detectors TPC is providing tracking, pattern recognition, vertex reconstruction and charged particles identification. The TPC has cylindrical body with diameter of 2.8 m and length of 3.4 m and placed in magnet with solenoidal field 0.5 T. Sensitive volume contains 17.6 m^3 of argon-methane mixture. Detector will register charged products of heavy ions collisions and providing events registration with trigger rate up to 7 kHz.
Report presents parameters of the TPC and development status of its sub-systems such as: field cage and high-voltage electrode, readout chambers, laser calibration system, temperature stabilization system, gas system, front-end electronics and others. TPC assembling procedure and infrastructure are presented in the report as well.

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