

# STATUS OF THE TIME PROJECTION CHAMBER FOR THE MPD/NICA PROJECT

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Within the framework of 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 realization. It will operate at luminosity up to  $10^{27} \text{ cm}^{-2} \text{ s}^{-1}$  for  $\text{Au}^{79+}$  ions. Two interaction points are foreseen at the NICA for two detectors which will operate simultaneously. One of these detectors, the Multi-Purpose Detector (MPD), is optimized for investigations of heavy-ion collisions. The Time-Projection Chamber (TPC) is the main tracking detector and charged particles identification of the MPD central barrel. The TPC/MPD will provide: the overall acceptance of  $|\eta| < 1.2$ ; the momentum resolution for charge particles under 3 % in the transverse momentum range  $0.1 < p_t < 1 \text{ GeV}/c$ ; two-track resolution of about 1 cm; hadron and lepton identification by  $dE/dx$  measurements with a resolution higher than 8 %. These requirements must be satisfied at the NICA design luminosity, charged particle multiplicity  $\sim 1000$  in central collisions and the event rate about 7 kHz.

The TPC design and structure are similar to those of the TPCs used in the STAR, ALICE and NA49 experiments. The TPC being a large but

conceptually simple detector must be constructed with very high precision to reduce nonlinear systematic effects. High stability of the mechanical structure and uniformity of the drift field, the temperature, the drift gas purity and the gas gain have to be provided to get precise track reconstruction and energy-loss measurements.

The basic design parameters of the TPC and the basic TPC configuration are presented. The scheme of TPC readout chamber, pad plane and TPC gas system are shown.