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Straw Tracker of the future Spin Physics Detector at NICA collider

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The Spin Physics Detector (SPD) at the NICA collider at JINR is being developed to measure the nucleon spin structure. Polarized proton and deuteron beams will collide at the centre-of-mass energy up to 27 GeV in the proton-proton collision mode, with instantaneous luminosity up to $1e32$ Hz/cm². Tracks of charged particles will be measured in the magnetic field of a superconducting magnet with straw-based tracking system. Besides of the track coordinate measurements, the tracker will be used as a part of the particle identification system (PID). The barrel part of the tracker will be made of thin-wall straw tubes produced with ultrasonic welding of a metallized PET foil. The straws have 1 cm diameter and will be assembled in self-supporting octants made of 31 double-layers, resulting in total in ~25 000 readout channels. The tracker should have a good spatial resolution and provide measurements of the particle ionization losses serving the PID. This implies a challenging requirement to the tracker readout electronics. In this talk we present several possible concepts of the readout electronics together with simulation of the straw response compared to the test beam measurements.

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