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Measurement of the spatial and energy-loss resolution with a prototype Straw Tube Tracker (STT) for the PANDA experiment

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The PANDA experiment is one of the pillars of the future Facility for Antiproton and Ion Research (FAIR) in Darmstadt, Germany. The PANDA physics program is focused on answering fundamental questions re- lated to Quantum Chromodynamics (QCD), mostly in the non-perturbative energy regime, using antiproton collisions on proton and nucleon targets. The central Straw Tube Tracker (STT) will be the main tracking detector of the PANDA target spectrometer. The main tasks of the STT will be the measurement of the particle momentum from the reconstructed tracks (with a spatial resolution ⊠ 150 μm transversal) and the measurement of the specific energy-loss for particle identification (with an energy resolution better than 10%), especially for particles with momenta below 1 GeV/c. In this work, results obtained with a prototype STT using a proton beam with different momenta are shown and discussed, with an emphasis to the spatial resolution and the energy-loss for the different momenta.

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