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## The PANDA barrel-TOF detector at FAIR

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### Content

The triggerless detector system  $\bar{P}$ ANDA which is being built at the FAIR facility. The versatile detector system will enable us to study open questions in hadron physics, by doing charmonium spectroscopy with precision measurements of mass, width and decay branches, investigating possible exotic states, search for modifications of charmed hadrons in nuclear matter and gamma-ray spectroscopy of hypernuclei by using antiprotons on a cluster jet or a pellet target in the momentum range of 1.5 to 15 GeV/c.

The barrel-TOF subdetector is one of the outer layers of the multi-layer design of the PANDA barrel. It is designed with a minimal material budget in mind mainly consisting of  $90 \times 30 \times 5 \text{ mm}^3$  thin plastic scintillator tiles read out on each end by a serial connection of 4 SiPMs. 120 such tiles are placed on 16  $2460 \times 180 \text{ mm}^2$  PCB boards forming a barrel covering an azimuthal angle from  $22.5^\circ$  to  $150^\circ$ . The detector is designed to achieve a time resolution below 100 ps ( $\sigma$ ) which allows for good event separation as well as particle identification below the Cherenkov threshold via the time-of-flight, simultaneously providing the interaction times of events. The current prototype achieved  $\sim 60$  ps, well below the design goal.

The R&D is in a matured stage and a technical design report is currently being reviewed by the collaboration. In this contribution the whole project from the design concept to the latest result of test beamtime as well as the future outlook will be presented.

### Summary

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