

## **The PANDA Microvertex Detector: Design and Prototype Results**

The design concept and the status of the microvertex detector (MVD) of the PANDA experiment at FAIR (Darmstadt, Germany) is reviewed. Panda will exploit cooled antiproton beams in a momentum range from 1 to 15 GeV/c to perform high precision QCD studies. Different types of targets, from hydrogen up to gold, will be used and the maximum interaction rate will reach up  $10^7$  annihilations per second.

One of the key features of the Panda detector is the triggerless data acquisition scheme which maximizes the number of physics channels that can be inspected simultaneously. This demands that all the subdetectors run without an external trigger and provide time-tagged events with a time resolution in a few ns range. The presentation will concentrate on the MVD which is the subsystem closest to the interaction point. The MVD is formed by four barrels surrounding the target region and six forward disks. Fast sensors with high granularity and good timing capability are required. Therefore, hybrid silicon pixels and double sided microstrips have been chosen. The front-end electronics of the MVD will measure also the signal charge. This will allow time-walk calibrations and resolution improvement through charge sharing. Furthermore, the MVD will assist also in low-momentum particle identification through  $dE/dx$  measurements.

The talk will focus on implementation challenges, discussing in particular key aspects of the front-end design and recent results obtained from prototypes.